



U.S. Department of Energy
Office of River Protection

P.O. Box 450, MSIN H6-60
Richland, Washington 99352

0069128

06-ED-023

MAR 22 2006

Ms. Jane Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99352

RECEIVED
MAR 27 2006
EDMC

Dear Ms. Hedges:

FINAL DANGEROUS AND/OR MIXED WASTE RESEARCH, DEVELOPMENT, AND
DEMONSTRATION PERMIT (RD&D Permit) FOR THE DEMONSTRATION BULK
VITRIFICATION FACILITY: REQUIRED SUBMITTAL FOR DRIED WASTE HANDLING
SYSTEM

Reference: WA7890008967, "Permit for Dangerous and/or Mixed Waste Research,
Development, and Demonstration (RD&D Permit) for the Demonstration Bulk
Vitrification System (DBVS)."

This letter transmits the engineering design and supporting information for the DBVS Dried
Waste Handling System (Attachments 2, 3, and 4) for the State of Washington Department of
Ecology (Ecology) review and approval. The attached information is the fifth of seven design
packages to be submitted to Ecology as required by the Reference. CH2M HILL Hanford
Group, Inc. and the U.S. Department of Energy, Office of River Protection (ORP) certification
statements are provided in Attachment 1.

The following engineering design and support information for the Dried Waste Handling System
are attached. The RD&D Permit conditions satisfied by these attachments are also identified.

1. Certification Statement (Attachment 1);
2. RPP-24544, "Demonstration Bulk Vitrification System IQRPE/RCRA Design Review
Package," Revision 1b, (Attachment 2); permit conditions V.I.2 and V.I.3;
3. DR-011, "Review of Demonstration Bulk Vitrification System IQRPE/RCRA Design
Review Package RPP-24544, Revision 0," (Attachment 3); permit conditions V.I.2.a and
V.I.3; and
4. Permit Tables IV.1, IV.2, IV.3, V.1, V.2, V.3, V.4, V.5, and V.6. (Attachment 4); Permit
conditions IV.A.8.e and V.I.5.

Ms. Jane Hedges
06-ED-023

-2-

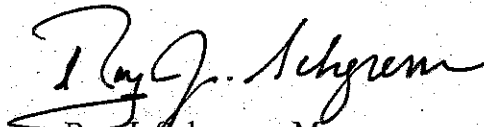
MAR 22 2006

The Dried Waste Handling System receives waste from the Waste Dryer System and directs the dried waste to the waste receiving units located above the in container vitrification (ICV) container. The waste receiving units direct the waste through chutes contained in an Ancillary

Waste Transfer Enclosure to the ICV container. The RD&D Permit requires that we receive approval from Ecology for the engineering information as specified in the above permit conditions for incorporation into RD&D Permit Attachments KK and LL. ORP looks forward to Ecology's review and approval of this design package.

If you have any questions, please contact me, or your staff may contact Woody Russell, Environmental Division, (509) 373-5227.

Sincerely,



Roy J. Schepens, Manager
Office of River Protection

ED:RWR

Attachments: (4)
(in CD format also)

cc: See page 3

Ms. Jane Hedges
06-ED-023

-3-

MAR 22 2006

cc w/attachs:

K. Conaway, Ecology (1 CD)
S. Dahl, Ecology
T. Hill, Ecology (1 CD)
Administrative Record
CH2M Correspondence Control
Environmental Portal, LMSI

cc w/o attachs:


P. K. Brockman, CH2M HILL
M. N. Jaraysi, CH2M HILL
F. R. Miera, CH2M HILL
D. H. Shuford, CH2M HILL
M. S. Spears, CH2M HILL
J. E. Van Beek, CH2M HILL
J. Cox, CTUIR
S. Harris, CTUIR
S. A. Thompson, FHI
G. Bohnie, NPT
K. Niles, Oregon Energy
J. Hebdon, RL
A. C. McKarns, RL
R. Jim, YN

Attachment 1
06-ED-023

CH2M HILL Hanford Group, Inc. and U.S. Department of Energy,
Office of River Protection Certification Statement

The following certification is required by WAC 173-303-810(13) for all applications and reports submitted to Ecology.

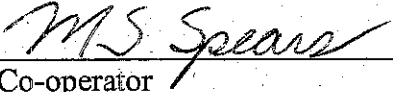
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Owner/Operator
Roy J. Schepens, Manager
Office of River Protection
U.S. Department of Energy

3/22/06

Date



Co-operator
Mark S. Spears, President
and Chief Executive Officer
CH2M HILL Hanford Group, Inc.

3/3/06

Date

Attachment 3
06-ED-023

IQRPE Design Assessment Report No. DR-011, Revision 0,
Review of Demonstration Bulk Vitrification System IQRPE/RCRA
Design Review Package, RPP-24544, Revision D

**Independent Qualified Registered Professional Engineer
Support to Demonstration Bulk Vitrification Project**

CH2M HILL Requisition # 114648

IQRPE Design Assessment Report No. DR-011, Rev. 0

Review of

**Demonstration Bulk Vitrification System IQRPE/RCRA
Design Review Package, RPP-24544, Revision E**

**Section 2.4, Dried Waste Handling System
(90 Percent Design)**

Prepared by:

Robert L. Goodman, Jr., PE
TechnoGeneral Services Company
710 N. 4th Avenue
Pasco, Washington 99301

Reviewed by:

Karl M. Walterskirchen, PE, Chief Engineer
TechnoGeneral Services Company
710 N. 4th Avenue
Pasco, Washington 99301

At the request of

CH2M HILL Hanford Group, Inc.
POB 1500
Richland, Washington 99352

February 24, 2006

Table of Contents

1.0	INTRODUCTION	5
1.1	Project Description.....	5
1.2	Design Review Requirements.....	5
1.3	Dried Waste Handling System Design Overview.....	7
1.3.1	Dried Waste Transfer System Overview (Specification 145579-D-SP-032, Rev. 2).....	9
1.3.2	Ancillary Waste Transfer Enclosure (AWTE) Overview (Specification 145579-D- SP-017, Rev. 3).....	9
1.3.3	Dried Waste and Top-Off Soil Airlock Assemblies Overview (Specification 145579- D-SP-018, Rev. 1).....	10
1.3.4	Melt Area Support Structure.....	10
1.4	Scope of IQRPE Design Assessment.....	11
2.0	ASSESSMENT	12
2.1	Codes, Standards and Regulations	14
2.2	Basis of Design	14
2.2.1	Structural Design Standards	14
2.2.1	Waste Compatibility	21
2.2.2	Pressure Control System.....	23
2.2.4	Secondary Containment System.....	26
2.2.5	Ancillary Equipment Design	29
2.2.6	Corrosion Assessment	31
2.2.7	Recommended Inspection Schedule	33
3.0	DESIGN REVIEW ASSESSMENT CERTIFICATIONS	36
4.0	REFERENCES	37

Tables

Table 1.	Selected Dried Waste Handling System Interlocks	8
Table 2.	Dried Waste Handling System Primary Operating Characteristics	14
Table 3.	Dried Waste Transfer System – Additional IQRPE Inspection Points.....	34

Figures

Figure 1. Demonstration Bulk Vitrification System Site Three-Dimensional View.....	6
Figure 2. Dried Waste Handling System Three-Dimensional View.....	13
Figure 3. Rapid Interactive Structural Analysis (RISA) Sample Output.....	20

Attachments

- A Dried Waste Handling System IQRPE Disposition of Calculations, Specifications, and Drawings
- B Dried Waste Handling System Design Deliverables to be Reviewed as Part of the Installation Certification Package
- C Codes, Standards, and Regulations Incorporated Into Technical Specification Packages
- D Dried Waste Handling System Piping & Instrumentation Diagrams
- E Engineering Corrosion Review

1.0 INTRODUCTION

The Washington State Department of Ecology (Ecology) has issued a permit for the Demonstration Bulk Vitrification System (DBVS) that mandates the use of an Independent Qualified Registered Professional Engineer (IQRPE) to perform a third-party independent review of the design of Ecology sensitive portions of the DBVS project. TechnoGeneral Services Company (TGS) has prepared this IQRPE Design Assessment Report at the request of CH2M HILL Hanford Group, Inc. (CH2M HILL), the project co-operator. TGS is the IQRPE of record for this project.

1.1 Project Description

The DBVS is a demonstration waste treatment plant operated under a Research, Development and Demonstration (RD&D) Permit issued by Ecology. The RD&D Permit is issued to the U.S. Department of Energy, Office of River Protection (DOE-ORP) and CH2M HILL. The DBVS plant will be located at the 200 West Area of the Hanford Site. The DBVS is being designed, constructed, and operated by AMEC, an engineering/services company from Vancouver, British Columbia, under contract to CH2M HILL. AMEC is tasked to comply with the RD&D Permit. Figure 1 shows a three-dimensional graphic view of the DBVS project.

The DBVS is designed to process a liquid salt solution of low-activity mixed waste (LAW) originating from Tank 241-S-109. Tank 241-S-109 is located adjacent to the DBVS facility. The LAW is to be converted into solid glass form by drying the LAW, mixing the LAW in dried form with soil, and melting it with an electric current. The project is intended to demonstrate the viability of immobilizing LAW from the tank farms utilizing a proprietary AMEC vitrification system. The demonstration is to involve treating up to 600,000 gal of waste in 18 months, producing up to 50 In-Container Vitrification (ICVTM) melt boxes of stabilized vitrified waste.

About 13,170 gal of LAW are to be processed in each melt box. A detailed description of the process is provided in Attachments AA and BB of the RD&D Permit.

1.2 Design Review Requirements

Many of the components of the DBVS will handle dangerous or mixed waste and are regulated by Ecology in the RD&D Permit. The RD&D Permit requires an IQRPE review of the design of these components prior to installation.

The Compliance Schedules, Sections IV.A.8 and V.I of the RD&D Permit, define the design documents to include drawings, specifications, calculations and other information as deemed necessary to support the design. The RD&D Permit identifies 7 systems, including the foundations system that will have design packages prepared for IQRPE review. CH2M HILL is providing the IQRPE with design review packages as AMEC completes the design.

As a basis for the IQRPE certification, a review is performed on a final version of the document "Demonstration Bulk Vitrification System IQRPE/RCRA Design Review Package", RPP-24544 as prepared by AMEC and reviewed and approved by CH2M HILL. Each design review

package includes a body of text that explains the purpose and scope of the DBVS and describes the overall process as well as the specific system addressed in the design package. Included as supporting information (appendices) are calculations, site maps, drawings, sketches, piping and instrumentation drawings (P&ID), process flow diagrams (PFD), waste characteristic assessments, technical specifications for materials and equipment, and miscellaneous supporting data. Each design review package will consist of a revision of the RPP-24544 document, specific to the system addressed in the package. CH2M HILL is not requiring AMEC to seal/stamp final design documents per WAC requirements for any DBVS work other than the Site Improvements work (foundations and site work). Documents such as drawings, calculations, and specifications included in the design review package that are marked as final and have signatures for the preparer, checker, and approver, will be reviewed by the IQRPE as a complete document. All other documents will be reviewed as preliminary or supportive information.

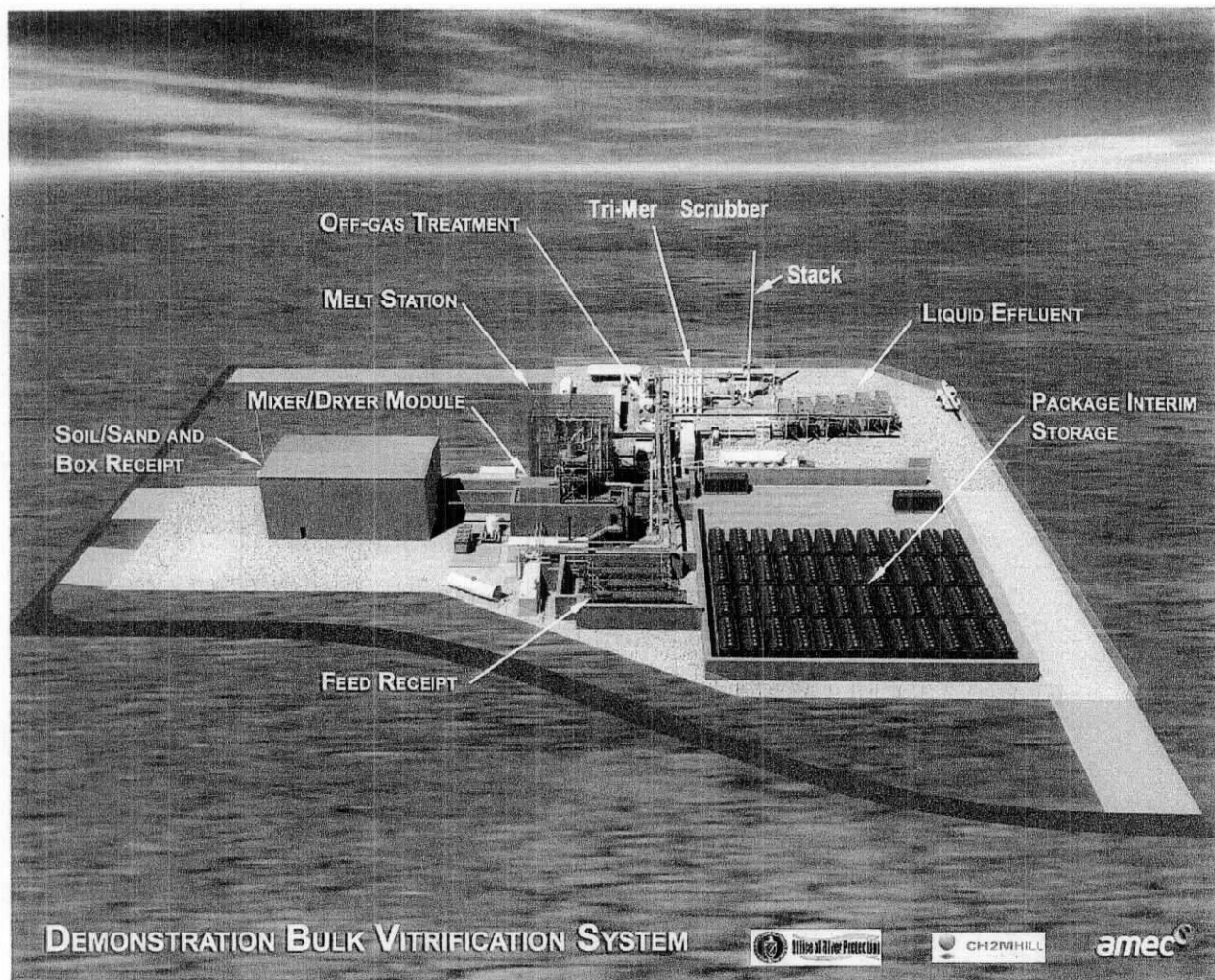


Figure 1. Demonstration Bulk Vitrification System Site Three-Dimensional View.

Preliminary design data was submitted and reviewed by the IQRPE reviewer as part of this certification, but only in an effort to familiarize the reviewer with the design until receipt of the final version.

The fourth system identified for IQRPE design review is the Dried Waste Handling System, Section 2.4 of RPP-24544, Rev. D, hereafter known as Design Package 2.4. The function of the Dried Waste Handling System is to pneumatically convey dried waste from the Waste Dryer System to the In-Container Vitrification System (ICV™) System. The dried waste can be transferred at up to 16,000 lb/h. The system uses as little air as required to keep the transfer lines from acquiring buildup or plugging. The system will be used intermittently to transfer the dryer contents to the ICV™ box, approximately three times a day.

1.3 Dried Waste Handling System Design Overview

This certification of the Dried Waste Handling System is based on the information presented in Design Package 2.4. The design package includes multiple calculations, specifications, and drawings, as summarized in Attachment A. TGS is providing one IQRPE design review report for the Dried Waste Handling System.

The Dried Waste Handling System includes the following major components:

- Dried Waste Transfer System (SP-032, Rev. 2), including:
 - Dried Waste Inlet Skid (interfaces with the Waste Dryer System)
 - Dried Waste Transfer Skid (provides motive force for material conveyance)
 - Waste Receiver and filter housings
 - Interconnecting piping and valves
- Ancillary Waste Transfer Enclosure (AWTE) - (SP-017, Rev. 3), including:
 - AWTE Shell
 - Upper Guide Chutes
 - Lower Sliding Chutes
 - Dried Waste Airlock Assemblies (SP-018, Rev. 1)
 - Top-Off Soil Feed Chute Airlock Assemblies (SP-018, Rev. 1)
- Melt Area Support Structure

The dried waste inlet skid interfaces with the Waste Dryer System and the Dried Waste Transfer Skid provides motive force for material conveyance. The AWTE and transfer chute interface with the In-Container Vitrification System (ICV™) box lid represent the boundary with the ICV™ System.

Two types of interlocks are shown on the P&ID drawings associated with the Dried Waste Handling System:

1. Safety hardwired interlocks and
2. Control system (safety) related interlocks.

The interlocks are shown in Table 1 and consist of a condition and its required action. The list interlocks is preliminary and will be updated as information is obtained from the system fabricators per the Technical Specifications as given in Appendix G4. A description is located on both the source sheet as well as each designation sheet on the P&ID drawings. These interlocks are summarized in Table 1.

Table 1. Dried Waste Handling System Interlocks

Condition	Interlock Number	Action
Low ICV™ Inlet Air Flow (safety) from Drawing F-145579-33-A-0100*	I6 (hardwired)	Stop all waste transfer by <ul style="list-style-type: none"> De-energizes (shuts) Dried Waste Dryer Discharge Valve 33-YV-013. (See Drawing F-145579-33-A-0100)* De-energizes (shuts) Dried Waste Airlock Valves 34-YV-009, 34-YV-010, 34-YV-019, and 34-YV-020. (See Drawing F-145579-34-A-0101)*
Low ICV Inlet Air Flow (non-safety) from Drawing F-145579-33-A-0100*	I7 (control system)	Stops the Waste Feed Vacuum Blower 33-D61-094. (See Drawing F-145579-33-A-0100)*
Only one valve can be operated (open) at a time from Drawing F-145579-34-A-0101*	I9 (hardwired)	Prevents both airlock valves in a line from being opened at the same time. To open either valve, the paired valve must be closed. <ul style="list-style-type: none"> 34-YV-009 and 34-YV-010 34-YV-019 and 34-YV-020.

ICV = In-Container Vitrification (Trademark of AMEC, Inc.).

MCS = Monitoring and Control System.

* See Drawing F-145579-33-A-0106 in Appendix D4.

The following sections describe the major components included as part of the Dried Waste Handling System. Piping and instrumentation diagrams (P&ID) for these components are shown on Drawing F-145579-34-A-0101, Revision J (Bulk Vitrification AWTE & Waste Feed), and Drawing F-145579-33-A-0106, Revision G (Bulk Vitrification Waste Feed Dryer to Box), from Design Package 2.4. These two drawings are included in Attachment D of this report.

1.3.1 Dried Waste Transfer System Overview (Specification 145579-D-SP-032, Rev. 2)

Dried waste is to be lifted a vertical distance of 28 ft from the dryer discharge to the top of the AWTE. The dryer interface is located a vertical distance of 12 ft above the ground and it faces downward. The inlet port on the AWTE is located a vertical distance of 29 ft above the ground and faces upward. Sketches DBVS-SK-M107, Sheet 1, Rev. E, and Sheets 2 and 3, both Rev. C, in Appendix C4 of Design Package 2.4 show the component interfaces. While transferring, the waste transfer system will cycle between the two receivers above the AWTE. Dried waste is fed into the ICV™ System by using rotary valves and gravity. The waste receiver and filter housings are vented using a vacuum blower that draws through sintered metal filters and HEPA filters which then discharge to the Main Off-Gas Treatment System (OGTS).

During the transfer of dried waste, the interconnecting piping between the discharge of the Waste Dryer System and the waste receiver and filter housings is maintained at a vacuum relative to atmosphere. The gravity-fed line to the ICV™ System is also maintained at a slight negative pressure relative to atmosphere by the OGTS connection to the AWTE and ICV™ box plenum space. These conditions maintain both solids and vapors in the piping and transfer equipment with the vapors being vented to the OGTS.

1.3.2 Ancillary Waste Transfer Enclosure (AWTE) Overview (Specification 145579-D-SP-017, Rev. 3)

The AWTE provides a contained environment for the connection and disconnection of the dried waste feed chutes, the top-off soil chutes, the ICV™ box ventilation connection, electrodes, and the ICV™ off-gas connection.

With the ICV™ box correctly positioned in the melt station, the interfacing chutes and piping are lowered onto the box lid by a pair of pneumatic actuators and locked in place. Except for the electrodes, each chute and piping from the AWTE has a compressible seal around it that creates an individual seal with the box lid. When lowered onto the box lid, the weight compresses the seals against sealing plates located at each port. Covers on the bottom of the AWTE are opened to allow access to the box lid for removal of the port flanges in preparation for connecting the feed chutes. Each port in the ICV™ box lid also has a seal, and when the chutes are extended into the box lid a flange on the chute compresses the seal in the port. This effectively provides double containment during the transfer of dried waste into the ICV™ box. The same system is applied to the ventilation and level indicator openings. All connections to the box lid are locked in place to prevent accidental retraction of the chutes for any reason during the melt process.

The AWTE is vented to the OGTS to maintain a negative pressure inside the AWTE. The pressure inside the ICV™ box is maintained lower than the pressure inside the AWTE and atmospheric pressure, thus ensuring no leakage from the ICV™ box.

The dried waste feed chutes interface with the Dried Waste Transfer System at the discharge flange of the rotary feeders, located below the vacuum receiver units in the melt area enclosure. The top-off soil feed chutes interface with the process additive handling system at the discharge flange of the top-off soil impingement tanks in the melt area enclosure. These chutes interface with the AWTE and continue through the AWTE to their respective interface ports on the ICV™ box lid. The materials are gravity-fed from the discharge flange of the rotary feeders,

down the feed chutes, and into the dual isolation airlock system (see Technical Specification 145579-D-SP-018, Rev. 1 in Appendix G4). From the airlock, the material is discharged in batches down the chute and into the ICV™ box. Each chute has a telescopic section located inside the AWTE to allow extension into and retraction from the ICV™ box lid.

The five discharge chutes within the AWTE interface/mate with discharge chutes attached to the ICV box lid. The chutes on the lid are raised to connect with the AWTE discharge chutes and use a gasket for sealing. An environmental barrier will be used to provide a connection between the AWTE floor and the ICV box for each ICV box connection. The environmental barrier protects the workers, mitigates the spread of contamination, and seals the floor penetrations to the ICV box. The ICV box ventilation inlet and ventilation piping interface/mate with the ICV box lid via piping assemblies that are raised to connect with the ventilation piping within the AWTE.

1.3.3 Dried Waste and Top-Off Soil Airlock Assemblies Overview (Specification 145579-D-SP-018, Rev. 1)

One of the primary functions of the Box Feed System is to deliver dried waste during melt operations and top-off soil (at the completion of the melt operation) to the ICV™ container under a controlled, sealed, and contained environment. Two of the major components of the Box Feed system are the Dried Waste and Top-off Soil Airlock Assemblies (DWAA and TSAA). These components will facilitate and control delivery of the materials into the ICV™ box.

Due to the pressure difference between the ICV™ box and the dried waste transportation system blower, the main purpose of the DWAA is to prevent hot gases and NOx from moving back up the waste feed chute, and potentially into the atmosphere during an upset condition. The DWAA will also facilitate the delivery of radioactive dried waste to the ICV™ box at a controlled rate to facilitate the melt process. There are two DWAA's included in the system design.

The main purpose of the TSAA is to provide a seal for the top-off soil feed system and to prevent radioactive material/dust and hot gases in the ICV™ from exiting up through the top-off soil feed chute, into the clean top-off soil delivery system and potentially into the atmosphere. The TSAA will also facilitate the delivery of the top-off soil, which will be used as a shielding medium, into the ICV™ box on top of the vitrified waste at the completion of the melt process. There are three TSAAs included in the system design.

1.3.4 Melt Area Support Structure

The dried waste transfer skid, AWTE, material feed chutes, and process additives handling system equipment are supported by the melt area structure. The melt area structure general arrangement is shown on Drawings F-145579-00-D-0041 and F-145579-00-D-0051, both Rev. F in Appendix C4. Structural steel drawings for the melt area structure are contained in Appendix C4 of Design Package 2.4.

1.4 Scope of IQRPE Design Assessment

This IQRPE design report number is DR-011. This IQRPE design assessment includes a comprehensive review of Design Package 2.4, in accordance with the requirements of the DBVS RD&D Permit IV.A.8.b.i through IV.A.8.b.viii, IV.A.8.c.i, and V.I.2.a through V.I.2.f, and V.I.3.a through V.I.3.f. Any exceptions taken by the IQRPE to incomplete or unavailable items in Design Package 2.4 are listed in Section 2.2 at the end of each subsection. The documents included in this review and the level of each document review is summarized in Attachment A.

The following items are not covered by the WAC dangerous waste regulations or the RD&D Permit for the facility, and therefore are outside of the scope of this certification:

- Plant utilities, including instrument and plant air supply lines and electrical power beyond the first upstream valve or uninterruptible power supply systems.
- Structural features not related to hazardous waste secondary containment.
- Architectural features not related to hazardous waste containment.
- Lighting systems.
- System design features related to protection of the system due to vehicular traffic.
- Heating, ventilation, or air conditioning for the Dried Waste Handling System.
- Electrical or signal lines beyond the first upstream field termination box (FTB), motor control center (MCC), or instrument control panel (ICS). Specifications for electrical feed, including wiring, local hand switches, terminations, breakers, and other equipment or instruments located in motor control centers were reviewed. Specifications for instrument cabling and terminations were reviewed only between locally mounted devices and field termination boxes and/or local instrumentation and control panels.
- Radiation monitoring or detection components at various locations throughout the system.
- Verification of functional logic for operation and control of the Dried Waste Handling System.

This certification also excludes the review of the Design Review Package to the following design standards included in RPP-17403 because the Design Review Package does not address these issues:

- Section 3.1.2.1.1.3 and Table 3-3 requirements regarding waste feed radionuclide properties, including all radioactive and radionuclide property considerations.
- Section 3.1 requirements for the DBVS that the design:

- Ensure exposure of plant operating personnel to radioactive process streams (radiation) is as-low as reasonably achievable (ALARA). See also Sections 3.2.4 and 3.3.6.1.1.
- Minimize the production of secondary waste streams.
- Ensure that all process byproducts are safe for long-term storage or release into the environment.
- Section 3.3.1.6 requirements for the DBVS that the design include the capability for flushing components for decontamination.
- Section 3.3.6 requirements for the DBVS that the design related to the following:
 - Personnel Safety
 - Fire Protection
 - Non-Radioactive Airborne Emissions (Section 3.3.6.3.4)
 - Radioactive Airborne Emissions (Section 3.3.6.3.6)
- Section 3.3.8 (Decontamination and Deactivation) or Section 3.3.9 (Nuclear Safety) requirements for the DBVS.

A significant portion of the 90 percent design of the Dried Waste Handling System has been developed as a purchase specification, with the majority of the 'design' activities designated as the responsibility of the equipment vendor or SELLER. Therefore, most of the required design information will not be available until fabrication of the equipment is underway and this information will require IQRPE review as part of the installation certification package.

Design calculations and documentation to be reviewed by the IQRPE for inclusion with the installation certification package include the deliverables listed in Attachment B. A preliminary listing of inspection points requiring IQRPE review during fabrication and installation are given in Section 2.2.7 below.

2.0 ASSESSMENT

The Dried Waste Handling System includes the following major components:

- Dried Waste Transfer System (SP-032, Rev. 1), including:
 - Dried Waste Inlet Skid (interfaces with the Waste Dryer System)
 - Dried Waste Transfer Skid (provides motive force for material conveyance)
 - Waste Receiver and filter housings
 - Interconnecting piping and valves

- Ancillary Waste Transfer Enclosure (AWTE) - (SP-017, Rev. 3), including:
 - AWTE Shell (including four transfer ports or airlock assemblies and forty-four glove ports)
 - Upper Guide Chutes
 - Lower Sliding Chutes
 - Dried Waste Airlock Assemblies (SP-018, Rev. 1)
 - Top-Off Soil Feed Chute Airlock Assemblies (SP-018, Rev. 1)
- Melt Area Support Structure



Figure 2. Dried Waste Handling System Three-Dimensional View.

Figure 2 shows a three-dimensional representation of the Dried Waste Handling System components at the DBVS site. The following subsections identify the basis and methods used to complete this IQRPE design certification.

2.1 Codes, Standards and Regulations

The codes, standards, and regulations specifically used during the preparation of this certification are referenced as necessary throughout this report.

A complete list of codes, standards, and regulations that have been incorporated into the Technical Specification packages is included as Attachment C to this report.

The IQRPE concurs with the use of the codes, standards, and regulations that have been designated in the Technical Specifications.

2.2 Basis of Design

The Dried Waste Handling System is anticipated to operate for a minimum service life of 2 years and the equipment has been specified with a design life of 5 years. The primary operating characteristics are presented in Table 2.

Table 2. Dried Waste Handling System Primary Operating Characteristics

Operating Characteristic	Range
Dried Waste Transfer Rate	Up to 16,000 lb/hr
Dried Waste Maximum Temperature	250 F
Material Transfer Types	Dried Waste and Hanford Soil

The following sections highlight the structural design standards, waste compatibility, pressure control system, secondary containment system, ancillary equipment design, corrosion assessment, and inspection schedule recommendations for the Dried Waste Handling System.

2.2.1 Structural Design Standards

Ecology (1995) requires that an IQRPE certify that the proposed tank system will have a sufficient structural integrity and is acceptable for storing and treating dangerous waste in accordance with WAC 173-303-640(3)(a). This assessment must show that the foundation, structural support, seams, connections, and pressure controls are adequately designed and that the tank system has sufficient structural strength, compatibility with the wastes to be stored or treated, and corrosion protection to ensure that it will not collapse, rupture, or fail in accordance with WAC 173-303-640(3)(a).

The Dried Waste Handling System equipment and structures will be analyzed and designed in accordance with UBC (1997) and ASCE 7-98. The calculations will demonstrate that equipment and the structure will withstand applied loads without loss of integrity or release of

radioactive/hazardous material. They will also show that the skids will not tip over nor slide. The structural analysis requirements are identified in the component Technical Specifications given in Appendix G4.

Mechanical calculations performed for the piping system will be prepared in accordance with piping code requirements in ASME B31.3. Calculations will include the following areas as applicable:

- Pipe wall thickness calculations for pressure,
- Stress calculations for sustained loads because of pressure, dead load, and any other sustained loads,
- Stress calculations for displacement stresses, such as thermal loads, and
- Stress calculations for occasional loads such as pressure, dead weight, other sustained loads, and earthquake loads.

Mechanical calculations will also account for compatibility of the selected material components with the waste material to be handled, and assess if an allowance is required for corrosion, or other wear (such as erosion), in the design of the system. Additional calculations that may be performed, if applicable for the assembled system, include: vacuum pump sizing, valve actuator sizing, and wear allowances.

The following activities have been conducted in the review of the design standards for the Dried Waste Handling System:

- The structural design standards and criteria used have been reviewed to ensure that they clearly and specifically reference applicable industry standards and recommended practice codes.
- Design criteria that apply to Dried Waste Handling System equipment have been reviewed to ensure that they are clearly indicated.

Structural calculations are normally part of the IQRPE review. Because the Technical Specifications prepared for the Dried Waste Handling System IQRPE/RCRA Design Review Package are purchase specifications that place the responsibility for the structural calculations on the SELLER, a complete review of the structural calculations has not been completed.

Structural calculations to be submitted by the SELLER and reviewed by the IQRPE at a later date are listed in Attachment B. The Dried Waste Handling System equipment and structures will be analyzed and designed in accordance with the requirements in TFC-ENG-STD-06. The calculations will demonstrate that equipment will withstand applied loads without loss of integrity or release of radioactive/hazardous material. The calculations will also show that the Dried Waste Handling equipment will not tip over nor slide. The applicable structural analysis requirements from the standard have been flowed down into specifications to the equipment supplier. The equipment supplier is required to perform the structural analysis and provide structural calculations consistent with the design drawings submitted for equipment fabrication.

The Melt Area Support Structure and Dried Waste Handling Equipment will be placed on DBVS Foundation No. 1. A structural review of Foundation No. 1 was included as part of the certification of Calculation 145579-C-CA-011, Revision 3, Melt Area Support Structure & Foundation (Fdn #1), IQRPE Design Certification Report DR-002, Rev. 0. A separate review of this calculation was not conducted as part of this IQRPE report.

The equipment supplier shall provide two skids mounted with dried waste transfer equipment. One skid will support the components for the inlet of the system. This dried waste inlet skid shall be free standing and will be anchored to a concrete pad. The second skid will support the dried waste transfer vacuum pump, high-efficiency particulate air (HEPA) filters, and associated piping and electrical components located at the outlet of the system. The dried waste transfer skid shall be free standing and will rest on the melt area support structure above the ICV™ box inlet. Vendor-provided interconnecting piping and valves between the two skids, piping connecting the skids to the waste receiver and filter housings, and the waste receiver and filter housings themselves shall be supported by attachment to the melt area support structure.

Where possible, the IQRPE has reviewed Design Package 2.4 to ensure that the following activities have been incorporated into the Technical Specifications as part of the design basis:

- Structural calculations will be provided for the Dried Waste Handling System components.
- The Dried Waste Handling System components will be designed based on a full load.
- Calculations will be provided that account for liquid specific gravity, external hydrostatic pressure, and variables such as internal vapor pressure, as appropriate.
- Provisions have been made such that the initially computed shell thickness will be increased to account for the assumed corrosion / erosion rate.
- Design parameters used in structural calculations will be clearly indicated and labeled on clarifying sketches.
- Seismic considerations, which are appropriate to the seismic risk zone in which the facility is located, will be accounted for in the structural calculations.
- The foundation underlying the tank system will support the load of the dried waste handling system plus the melt area structure per the requirements of WAC 173-303-640(3)(a)(v)(A). This was previously certified by the IQRPE as part of DR-002.
- The foundation has been designed to prevent failure due to settlement, compression, and uplift per the requirements of WAC 173-303-640(4)(c)(II). This was previously certified by the IQRPE as part of DR-002.
- The design plans require that homogeneous, porous, noncorrosive backfill material be placed below and around tank system foundations and underground piping to provide uniform structural support and prevent excessive settlement. This was previously certified by the IQRPE as part of DR-002.

- The tank systems have been designed to withstand the effects of frost heave per the requirements of WAC 173-303-640(3)(a)(v)(C). This was previously certified by the IQRPE as part of DR-002.

The following subsections highlight the IQRPE Structural Design Standard review for each of the major Dried Waste Handling System components, and also identify any specific exceptions to this IQRPE certification report as they relate to the structural review.

2.2.1.1 Dried Waste Transfer System (SP-032, Rev 2)

This Technical Specification was reviewed to ensure that provisions for the proper loads, supports, and design basis had been incorporated. The IQRPE concludes that the appropriate structural considerations have been made.

2.2.1.2 Ancillary Waste Transfer Enclosure (AWTE) - (SP-017, Rev. 3)

This Technical Specification was reviewed to ensure that provisions for the proper loads, supports, and design basis had been incorporated. The IQRPE concludes that the appropriate structural considerations have been made.

2.2.1.3 Dried Waste and Top-Off Soil Airlock Assemblies (SP-018, Rev. 1)

This Technical Specification was reviewed to ensure that provisions for the proper loads, supports, and design basis had been incorporated. The IQRPE concludes that the appropriate structural considerations have been made.

2.2.1.4 Melt Area Support Structure (145579-B-CA-011, Rev. 4)

Part of the Design Package 2.4 includes the structural steel supporting structure for the Dried Waste Handling System, referred to hereafter as the Melt Area Support Structure. The IQRPE performed an independent assessment of the Melt Area Support Structure calculations, drawings, and attachment point loads and reactions. The Melt Area Support Structure calculation was reviewed to ensure that provisions for the proper loads, supports, and design basis had been incorporated. Structural design standards and criteria were also reviewed to ensure that they clearly identified and referenced applicable codes, industry standards, and recommended practices. The IQRPE concludes that the appropriate structural considerations for the Melt Area Support Structure have been made.

2.2.1.4.a Independent Modeling Results and Calculation Review

An independent model was generated for the melt area support structure based on the AMEC design. The magnitudes of the equipment loads were preliminary within the submitted calculation and are preliminary within the independent model since final equipment loads were not available from the vendors. The independent model included the connection locations for all members with their appropriate eccentric off-sets instead of being modeled at a common point. This was done to insure that connection design was adequate to take the additional twisting and

bending associated with the actual connection arrangement which would not be apparent when connections are modeled to a common point. Results from the independent model shows that the framing members and arrangements are adequately designed to support the design loads.

TGS utilized the structural engineering expertise of subcontractors Los Alamos Technical Associates (LATA) and Parker Messana and Associates (PMA) to help assess this design.

IQRPE structural modeling utilized a Rapid Interactive Structural Analysis (RISA) code developed by Los Alamos Technical Associates, Inc. (LATA), which was configured for the Melt Area Support Structure geometric, mathematical, and physical structural properties. The approach using the RISA model provided an independent assessment of the AMEC approach which used a STAAD-Pro structural calculation. The IQRPE review of the melt area support structure implemented an independent modeling of the structure in lieu of performing a line-by-line checking of the submitted calculation. The output was then evaluated for effects on structural members due to structural, equipment and grating weights, as well as resultant seismic and dynamic reaction forces.

PMA performed an IQRPE assessment of the steel support structure using forces determined by AMEC in their STAAD-PRO and manual calculations. PMA also reviewed the AMEC bracing and connection designs and the AMEC structural Steel Drawings. Hand calculated and verified seismic forces were reviewed and compared to the computer analysis input and output data. The PMA assessment included a review of input and output data from AMEC's STAAD-Pro computer model for the steel support structure. The STAAD-Pro data were reviewed and were to be compared to the results of forces determined from an independent RISA-3D structural model prepared by LATA and set up using the same parameters used for the STAAD-Pro model. Both models were based on AMEC's calculations. PMA specifically reviewed AMEC's manual calculations and seismic calculations per the 1997 Uniform Building Code (97 UBC) and the AISC 9th Edition Steel Specification. PMA also reviewed AMEC's bracing and connection designs and the AMEC structural steel drawings.

The braced frames at column lines Md and Ma have a combination of "X" bracing on the upper levels and eccentric bracing on the bottom level. PMA found that the calculations for bracing and brace connections are in compliance with 1997 UBC requirements.

The frames at column lines Mc and Mb have no vertical bracing and rely on a horizontal truss to transfer lateral loads to column lines Md and Ma. The 97 UBC, Section 1633.2.3 requires that "Connections that resist design seismic forces shall be designed and detailed on the drawings". Horizontal bracing connections shown on AMEC drawings have sufficient detail to meet this requirement.

PMA specifically reviewed the AMEC manual calculations and seismic calculations, per the 1997 UBC code requirements and the AISC 9th Edition steel specification requirements. Seismic calculations performed by AMEC appear consistent with 97 UBC requirements. Vertical dead and live loads appear to have been correctly accounted for and the results of both computer programs were comparable.

Figure 3 contains a RISA 3D Sample Output Graphic, which represents a simplification of actual RISA output results.

The IQRPE concludes that the appropriate structural considerations have been made.

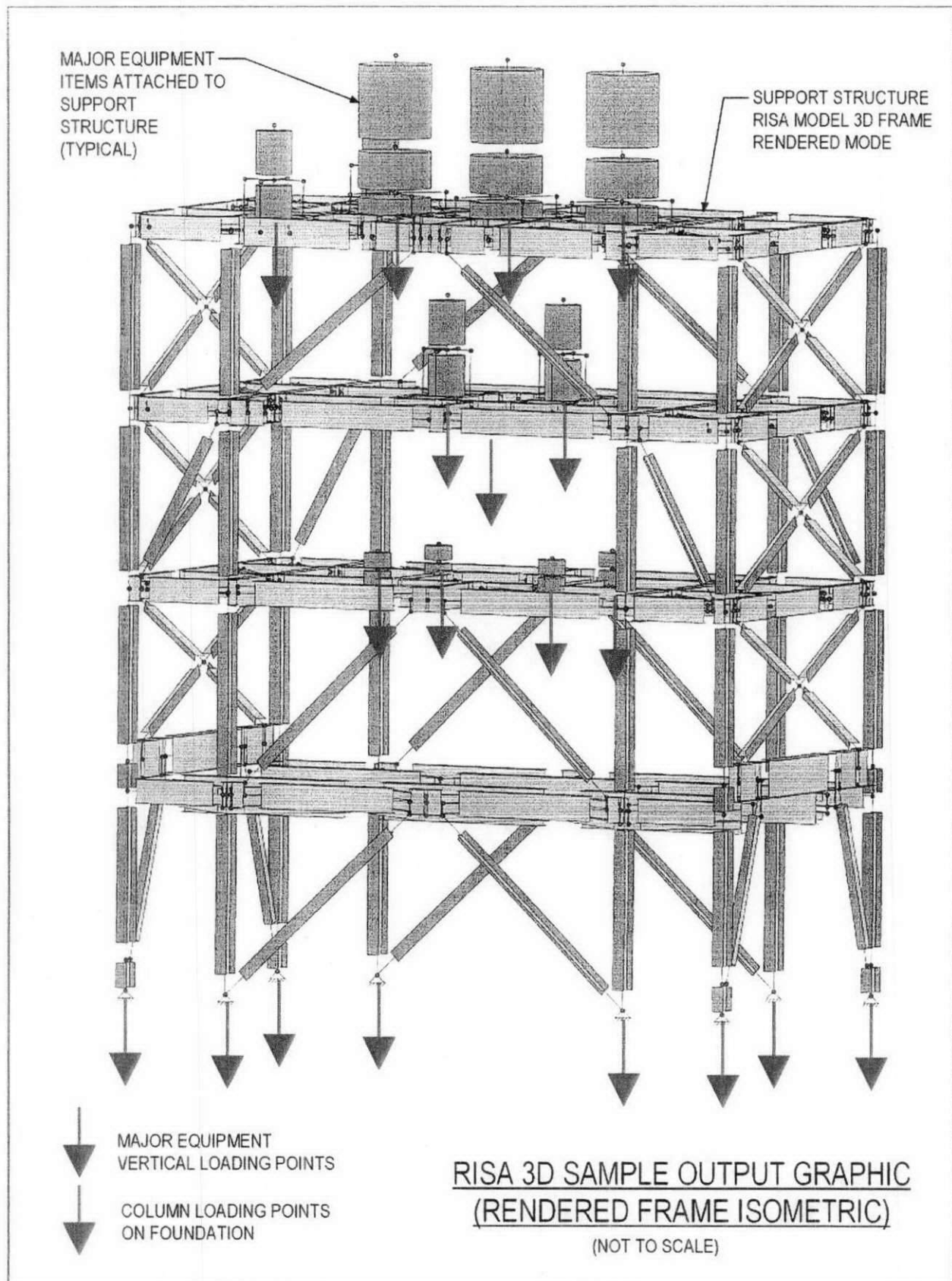


Figure 3. Rapid Interactive Structural Analysis (RISA) Sample Output.

2.2.1.5 Structural Design Exceptions

There are no exceptions to the IQRPE certification of the structural review assessment.

2.2.1 Waste Compatibility

Ecology (1995) requires that an IQRPE certify that the proposed tank system has been designed of materials compatible with the waste to be stored or treated. The Dried Waste Handling System is designed to pneumatically convey dried waste material from the Waste Dryer System to the ICV™ System. Physical properties of the material to be conveyed are contained in the technical specifications given in Appendix G4. Because this is a dry system with little potential to introduce moisture into the system, the specifications are mainly focused on the physical characteristics rather than the chemical properties of the dried waste material.

Conclusions from the review of the design standards, and physical and chemical properties of the dried waste and soil are summarized below:

- The proposed materials for the tank system are compatible with the wastes to be stored or treated per the requirements of WAC 173-303-640(3)(a).
- The proposed dangerous wastes or treatment reagents may be placed into the proposed tank system without causing the tank system to rupture, leak, corrode, or otherwise fail per the requirements of WAC 173-303-640(5)(a).

The IQRPE reviewed the waste property information in conjunction with the design specifications and the proposed metallurgy, materials, gaskets, and sealants of the Dried Waste Handling System components.

A completed waste compatibility evaluation is normally part of the IQRPE review and includes an assessment showing that the characteristics of the waste to be stored or treated are compatible with the material properties of the tank system, including material properties of any interior or exterior protective coatings. Since the majority of the Technical Specifications prepared for Design Package 2.4 are purchase specifications that place the responsibility for any interior or exterior coatings of the Dried Waste Handling System components on the SELLER, a complete review of proposed coatings and the associated preparation and application procedures has not been completed by the IQRPE.

Coating information to be submitted by the SELLER and to be reviewed by the IQRPE at a later date is listed in Attachment B. Information regarding the waste properties to be moved through the Dried Waste Handling System is given in the technical specifications for the dried waste handling system components.

The following sections summarize the IQRPE Waste Compatibility reviews for each of the major Dried Waste Handling System components. Specific exceptions to this IQRPE certification report related to the waste compatibility review are listed in 2.2.2.5 below.

2.2.2.1 Dried Waste Transfer System (SP-032, Rev 2)

The Dried Waste Transfer System shall be designed to pneumatically convey the dried waste from the dryer to the ICV™ box. The system shall be capable of transferring 16,000 lb/h. The waste will have the properties of the materials listed as Littleford Day, Inc. dried blend product and Hanford Site soil in Appendix B of the Technical Specification. The Seller shall review the Flow Properties Test Report and provide to the Buyer a simple assessment that identifies the specific waste property values, with basis, to be used for the design of the Seller's equipment. This assessment will be reviewed by the Buyer to ensure the selected waste property values are consistent with Buyer operating plans.

Piping components (e.g., fittings and fasteners) shall be listed components in accordance with ASME B31.3. Piping systems shall be fabricated, inspected, and tested in accordance with ASME B31.3, Category D, piping code for "Normal Fluid Service." The piping shall be carbon steel. The minimum design pressure for the dried waste transfer system piping and components, including instrumentation, is to be determined by the Seller and reviewed by the Buyer. The Seller shall select materials based on acceptable lifetime performance of materials subjected to the chemical and radiation exposures described in the Technical Specification.

The waste receivers, diverter, rotary valves, and knife gate valves have been specified as carbon steel with reference to the appropriate ASTM standards. The filter housings and piping have been specified as Type 316L stainless steel. The vacuum pump has been specified as either cast iron or Type 316 stainless steel. There is some discrepancy between the technical specification and the data sheets as to which parts are carbon steel and what parts are stainless steel.

Equipment designs and materials of construction will be chosen to demonstrate that they are able to meet or exceed the durability and reliability of the materials as specified in the Technical Specification.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.2.2 Ancillary Waste Transfer Enclosure (AWTE) - (SP-017, Rev. 3)

The primary function of the AWTE is to facilitate the transfer of a radioactive waste/soil mixture, under controlled and contained conditions, into the ICV™ box for processing. The fabricated AWTE shell will be of double skinned construction to provide a smooth clean surface both inside and outside. A structural steel framework or skeleton, clad with sheet metal, is the suggested method of construction.

The AWTE structure, including skin, frame, brackets, nuts, and bolts has been specified as carbon steel with reference to the appropriate ASTM standards. The chutes and flanges have been specified as Type 316L stainless steel.

The AWTE, with the use of glove bags, will provide a controlled environment for the safe connection and disconnection of the fill and ventilation systems.

The AWTE material will be specified by the vendor as appropriate for the temperature and radiation exposure of the environment.

Equipment designs and materials of construction will be chosen to demonstrate that they are able to meet or exceed the durability and reliability of the materials as specified in the Technical Specification.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.2.3 Dried Waste and Top-Off Soil Airlock Assemblies (SP-018, Rev. 1)

The DWAA shall prevent hot gases and NO_x from moving back up through the waste feed chute and into the waste feed system. The DWAA shall facilitate the delivery of dried waste into the ICV™ Box. The TSAA shall prevent hot and radioactive gases from entering the top-off soil feed system and will facilitate the delivery of top-off soil to the ICV™ container for a radiation shielding medium after completion of the melt process.

The airlocks for top-off soil and dried waste are specified as a body and contacting parts of stainless steel, with bolts, brackets, nuts, and flanges that have been specified as carbon steel with reference to the appropriate ASTM standards.

Equipment designs and materials of construction will be chosen to demonstrate that they are able to meet or exceed the durability and reliability of the materials as specified in the Technical Specification.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.2.4 Waste Compatibility Exceptions

IQRPE Certification exceptions to the waste compatibility review are as follows:

1. Appendix G4. Technical Specification SP-032, Rev. 2

The Dried Waste Transfer System will require material thickness allowance for erosion by the pneumatically conveyed waste material. The suitability of the material and the allowance for erosion will need to be evaluated once vendor information is available.

The equipment designs and final choices for the materials of construction, as well as the issues noted above, will require IQRPE review once vendor information is available. This review will be documented in the IQRPE installation assessment report.

2.2.2 Pressure Control System

Ecology (1995) requires that an IQRPE certify that the proposed tank system has been designed with appropriate pressure control systems. A review of the pressure control system is normally

part of the IQRPE review. A complete review of the pressure control system has not been completed by the IQRPE since the Technical Specifications prepared for Design Package 2.4 are purchase specifications that place the responsibility for the purchase of the pressure control system instrumentation for the Dried Waste Handling System equipment on the SELLER. Pressure control instrumentation to maintain both steady state and transient operation of the Dried Waste Handling System including sintered metal and HEPA filters, check valves, isolation valves, actuators, solenoid valves, pressure reducers, and vacuum pump equipment will need to be reviewed by the IQRPE at a later date.

Pressure control system information to be submitted by the SELLER and reviewed by the IQRPE at a later date is listed in Attachment B.

Conclusions from the review of the design standards for the Dried Waste Handling System are summarized below:

- The Technical Specifications include an acceptable preliminary piping and instrumentation system that will allow for adequate pressure control, per the requirements of WAC 173-303-640(3)(a).
- The Technical Specifications include the following basis for the detailed design of the tank system:
 - Tank capacity and design pressure.
 - The applicable characteristics of the waste to be stored or processed.
 - Maximum inflow and outflow rates.
 - The type of roof and how it is attached to the tank.
 - Locations of pressure relief vents and other pressure controls.
 - The pressure control system discharge locations.

The following sections highlight the IQRPE Pressure Control System review for each of the major Dried Waste Handling System components, and also identify specific exceptions to this IQRPE certification report as they relate to the pressure control system review.

2.2.3.1 Dried Waste Transfer System (SP-032, Rev 2)

The Dried Waste Handling System piping is designed to operate at a vacuum relative to atmosphere, with make-up air provided from the Waste Dryer Container, and exhaust to the Main Off-Gas Treatment (OTGS) System. For the Dried Waste Transfer System, differential pressure is measured across the sintered metal filters to determine when the sintered metal filters should be pulsed with compressed air to “clean” material back into the receiver unit. The purpose of the sintered metal filters is to minimize the contamination potential for the OGTS piping. Once a first-stage filter becomes loaded, it can be valved out of service to allow for change-out of the filter. Specific set-points will be based on manufacturer recommendations and the results from full-scale integration testing. Differential pressure is also measured across the

HEPA filters leading to the blower unit. The appropriate testing requirements have been specified to demonstrate this capacity.

Other than basic capacity information, no information is supplied on design pressures, vacuum pump capacity, or pressure ratings of piping and equipment. The transfer system skids piping, interconnecting piping and compressed air supply are to be designed, fabricated, inspected and tested in accordance with ASME B31.3 code requirements for "Normal Fluid Service".

The Dried Waste Transfer System is shown with appropriate instrumentation and interlocks to adequately control pressure of the system.

Pressure control system information to be submitted by the SELLER and reviewed by the IQRPE at a later date is listed in Attachment B.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.3.2 Ancillary Waste Transfer Enclosure (AWTE) – (SP-017, Rev. 3)

The AWTE is vented to the OGTS and maintained at a negative pressure relative to atmosphere. Flow is controlled and monitored with filtered inlet air with the differential pressure across the filter being monitored. Pressures and flows are monitored and controlled such that the ICV™ box is maintained at a greater vacuum than the AWTE, and gases generated by the process are contained by the ICV™ box.

No information is supplied on design pressures or pressure ratings of the AWTE shell in Design Package 2.4. The feed chutes and compressed air supply are to be designed, fabricated, inspected, and tested in accordance with ASME B31.3 code requirements for "Normal Fluid Service".

The AWTE is fitted with the appropriate pressure measurement and indicating devices at the necessary locations.

Pressure control system information to be submitted by the SELLER and reviewed by the IQRPE at a later date is listed in Attachment B.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.3.3 Dried Waste and Top-Off Soil Airlock Assemblies (SP-018, Rev 1)

The Dried Waste Handling System airlock assemblies for top-off soil and dried waste are designed to operate at a vacuum relative to atmosphere. The airlocks and associated piping are to be designed, fabricated, inspected, and tested in accordance with ASME B31.3 code requirements for "Normal Fluid Service".

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.3.4 Pressure Control System Exceptions

IQRPE Certification exceptions to the pressure control system review are as follows:

1. Appendix G4. Technical Specification SP-032, Rev. 2

This specification does not include information on design pressures, or pressure ratings of piping and equipment. This information will be supplied by the SELLER as part of their final design, and will be reviewed by the IQRPE as part of the installation certification package.

2. Appendix G4. Technical Specification SP-017, Rev. 3

This specification does not include information on design pressures for the AWTE shell. This information will be supplied by the SELLER as part of their final design, and will be reviewed by the IQRPE as part of the installation certification package.

The final equipment designs and the issues noted above will require IQRPE review once vendor information is available. This review will be documented in the IQRPE installation assessment report.

2.2.4 Secondary Containment System

Ecology (1995) requires that an IQRPE certify that the proposed tank system has been designed with appropriate secondary containment system. Secondary containment for tank systems that store, accumulate, or treat dangerous waste must be designed and installed to meet the requirements of WAC 173-303-640(4)(b).

Containment for the Dried Waste Handling System is accomplished through operation of the system at a vacuum relative to atmosphere, the use of pressure tested components, and the use of secondary containment for the interconnecting piping between the dried waste inlet skid and the dried waste transfer skid. Liquids are not present in the system, thus a leak detection system for liquids is not provided.

The dried waste feed chutes provide primary containment for the dried waste as it is delivered to the ICV box. The AWTE provides secondary containment at the process connections with the ICV box. The melt area enclosure provides additional containment around the AWTE and dried waste feed chutes.

A portion of the Dried Waste Handling System starting at the cyclone separators to the chutes that drop down into the AWTE, do not have leak detection as defined in 173-303-640(4)(b), however, this portion of the system is contained within an environmental enclosure. The purpose of this portion of the Dried Waste Handling System is to transfer dried waste from the waste dryer to the ICV. This area will be located above ground. The area within the environmental enclosure is not accessible to daily inspection due to ALARA concerns during an ongoing melt, and this portion of the system will be visually inspected for any evidence of leakage of the solid waste immediately before and after each melt.

Periodic visual inspection of the Dried Waste Handling System will be conducted to look for signs of dried waste leaks around the melt and dryer area equipment and to inspect the general condition of the containment system. In summary, the steps that will be taken in the area of leak detection for the Dried Waste Handling System are:

- The system will be checked before operation (visual inspection for equipment and piping alignment along with vendor and construction testing for pressure and tightness).
- Pinhole leaks in primary confinement barrier will result in a preferred path into the barrier because the system is operated at a vacuum relative to atmosphere. Sections that have secondary confinement have a pressure gauge on the secondary barrier to identify presence of a breach in the primary barrier.
- Visual inspections will be performed before, and after a melt campaign.
- Catastrophic failure is not unique to the Dried Waste Handling System and will be observed in a number of ways (e.g., Dried Waste Transfer System alarms will be activated when not in normal operating range, alarms for other systems will be activated when not in normal operating range, and locations such as the Waste Dryer and ICV Box are equipped with cameras, linked to the Control Trailer, which will show conditions in two of the processing units).

A review of the secondary containment system is normally part of the IQRPE review. Because the Technical Specifications prepared for Design Package 2.4 are purchase specifications that place the responsibility for the final design of the system components on the SELLER, a complete review of the secondary containment system has not been completed by the IQRPE.

Secondary containment system information to be submitted by the SELLER and reviewed by the IQRPE at a later date is listed in Attachment B of this IQRPE Design Assessment Report.

The final equipment designs, and the information noted above, will require IQRPE review once vendor information is available. This review will be documented in the IQRPE installation assessment report.

Conclusions from the review of the design standards for the Dried Waste Handling System are summarized below:

- The Dried Waste Handling System is designed to prevent any migration of wastes or accumulated liquid out of the secondary containment system to the soil, groundwater, or surface water at any time during the use of the tank system.
- The system is capable of detecting and collecting releases and accumulated liquids until the collected material is removed.
- The system is constructed of materials that are compatible with the wastes to be placed in the tank system.

- The system has been specified to have sufficient strength to withstand stresses due to static head during a release, pressure gradients, climatic conditions, nearby vehicle traffic, and other stresses resulting from daily operations.
- The system will be placed on a foundation or base that will support the secondary containment system, provide resistance to pressure gradients above and below the system and prevent failure due to excessive settlement, compression, or uplift.
- Liquids are not present in the system and so a leak detection system for liquids is not required nor provided.
- Liquids are not present in the system and so the system is not sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation.

The following sections highlight the IQRPE Secondary Containment System review for each of the major Dried Waste Handling System components, and also identify any specific exceptions to this IQRPE certification report as they relate to the secondary containment system review.

2.2.4.1 Dried Waste Transfer System (SP-032, Rev. 2)

The Dried Waste Transfer System between the Dried Waste Inlet Skid and the Dried Waste Transfer Skid is designed with encased pneumatic transfer lines for secondary containment. A leak into the encasement line will be detected by a pressure transmitter. Periodic visual inspection of the Dried Waste Handling System will be conducted to look for signs of dried waste leaks around the melt and dryer area equipment and to inspect the general condition of the containment system.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.4.2 Ancillary Waste Transfer Enclosure (AWTE) – (SP-017, Rev. 3)

The AWTE will have a double-skinned shell that provides secondary containment for waste material transported through the chutes into the ICV™. The AWTE provides secondary containment at the process connections with the ICV™ box. The melt area enclosure provides additional containment around the AWTE and the dried waste chutes.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.4.3 Dried Waste and Top-Off Soil Airlock Assemblies (SP-018, Rev. 1)

The dried waste feed chutes provide primary containment for the dried waste as it is delivered to the ICV™ box. The AWTE provides secondary containment at the process connections with the ICV™ box. The melt area enclosure provides additional containment around the AWTE and dried waste feed chutes. Periodic visual inspection of the Dried Waste Handling System will be

conducted to look for signs of dried waste leaks around the melt and dryer area equipment and to inspect the general condition of the containment system.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.4.4 Secondary Containment System Exceptions

There are no exceptions to the IQRPE certification of the secondary containment assessment.

2.2.5 Ancillary Equipment Design

Ecology (1995) requires that an IQRPE certify that the proposed tank system has been designed with appropriate ancillary equipment in accordance with the requirements of WAC 170-303-640(3)(f) and (4)(f). A review of the ancillary equipment design is normally part of the IQRPE review. Because the Technical Specifications prepared for Design Package 2.4 are purchase specifications that place responsibility for the final design configuration and the purchase of all instrumentation, valves, and electronics on the SELLER, a complete review of the ancillary equipment design has not been completed.

All technical specifications relating to Design Package 2.4 were reviewed for the following basic considerations:

- Reference to applicable codes and standards.
- Clear delineation of vendor scope of supply.
- Conformance to applicable design standards, including WAC 173-303-640.

Ancillary equipment design information to be submitted by the SELLER and reviewed by the IQRPE at a later date is listed in Attachment B.

Conclusions from the review of the design standards for the Dried Waste Handling System are summarized below:

- Secondary containment for the Dried Waste Handling System ancillary equipment is accomplished through operation of the system at a vacuum.
- Periodic visual inspections immediately before and after each melt for the Dried Waste Handling System ancillary equipment will be conducted to look for signs of dried waste leaks around the melt and dryer area equipment including all flanges, joints, valves, pumps, and other connections. The inspections will help determine the general condition of the containment system.
- If any evidence of leakage is observed, immediate action to contain any spilled material will be taken, and transfers of dried waste will not resume until all system components have been repaired.

The following sections highlight the IQRPE Ancillary Equipment Design review for the specifications, P&IDs, and data sheets for each of the major Dried Waste Handling System components, and also identify specific exceptions to this IQRPE certification report as they relate to the ancillary equipment design review.

2.2.5.1 P&ID Review

All P&IDs relating to Design Package 2.4 were reviewed for the following basic considerations:

- Appropriate locations of instrumentation, particularly with regard to primary sensing elements and final control elements.
- Correct and necessary labeling of pipe lines, valves, and instruments.
- Location of isolation valves to allow maintenance of instrumentation and equipment.
- Identification of interlocks.
- Designations of appropriate valve fail positions.
- Location of check valves or back-flow preventers.
- Appropriate alarms and control points shown.

2.2.5.2 Data Sheet Review

Data sheets included as part of the Technical Specifications listed below:

- SP-032, Rev. 2,
- SP-017, Rev. 3,
- SP-018, Rev. 1,

were reviewed in the following subject areas:

- Appropriate materials of construction.
- Appropriate functionality.
- Hazard classification requirements.
- Correct service conditions.
- Correct fail and control actions.

2.2.5.3 Instrument Loop Diagram Review

Instrument loop diagrams were reviewed by the IQRPE for the following:

- Correct references to the P&IDs.
- Correct wiring.
- Interlocks appropriately shown and wired.
- Control elements appropriately shown.

2.2.5.4 Ancillary Equipment Exceptions

IQRPE Certification exceptions to the ancillary equipment review are as follows:

1. General - Ancillary Equipment.

WAC requirements specify that the IQRPE review the design of ancillary equipment to ensure that it is supported and protected against physical damage and excessive stress due to settlement, vibrations, expansions, or contractions. Sufficient information is not available at this time to complete this level of review.

2. Appendix C4. General.

Instrument loop diagrams for area 33 included with Design Report 2.4 are preliminary, and will need to be updated with Vendor-specific instrumentation information during the detailed design. Final drawings will need to be reviewed by the IQRPE.

These issues will require IQRPE review once vendor information is available. This review will be documented in the IQRPE installation assessment report.

2.2.6 Corrosion Assessment

An IQRPE corrosion assessment is required only for the external shell of primary containment that is in direct contact with soil or water per the requirements of WAC 173-303-640(3)(a)(iii). The Dried Waste Handling System piping and equipment are all located aboveground, mounted on concrete pads or the melt area structural steel, and will not be in contact with soil or water. The secondary waste pump skid will be sitting on a concrete pad and will not be in contact with soil or water.

A corrosion expert has reviewed the Dried Waste Handling System specifications and has identified recommendations related to the effects of erosion of the dried waste and soil on system components, and the choice of carbon steel and scaling effects at elevated temperature. The planned actions to address the items noted in the corrosion review are described in a response letter to the corrosion expert included in Appendix H4 of Design Package 2.4. The IQRPE has performed an independent engineering corrosion assessment and takes no exceptions to the

corrosion assessment and the planned actions response letter included in Appendix H4 of Design Package 2.4.

The following reviews of the design standards for the Dried Waste Handling System have been completed:

- A review of the design information for the presence of any stray electrical current from nearby equipment using external power sources.
- A review of the corrosion protection recommendation for coatings and a cathodic protection system.
- A review of the provisions for corrosion allowance.
- A review of the provisions for erosion allowance.

The following sections highlight the IQRPE Corrosion Assessment review for each of the major Dried Waste Handling System components, and also identify specific exceptions to this IQRPE certification report as they relate to the corrosion assessment review.

2.2.6.1 Dried Waste Transfer System (SP-032, Rev. 2)

The IQRPE performed an independent engineering corrosion review and assessment for the Dried Waste Transfer System. The Dried Waste Transfer System metallurgy is adequately specified to prevent corrosion. The vendor will need to specify appropriate thickness of pipe and vessel walls, particularly at elbows and impingement points, to prevent failure from premature erosion. There is also some concern about entrained moisture condensing in the cooled waste and causing corrosion. It is recommended that a dew point sensor be incorporated within the Waste Dryer Container to monitor dew point.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.6.2 Ancillary Waste Transfer Enclosure (AWTE) – (SP-017, Rev. 3)

The IQRPE performed an independent engineering corrosion review and assessment for the Ancillary Waste Transfer Enclosure. The only corrosion concern with the AWTE is the potentially high temperatures experienced by the bottom of the unit. The vendor will need to specify appropriate materials and insulation to prevent corrosion.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.6.3 Dried Waste and Top-Off Soil Airlock Assemblies (SP-018, Rev. 1)

The IQRPE performed an independent engineering corrosion review and assessment for the Dried Waste and Top-Off Soil Airlock Assemblies. The dried waste and top-off soil airlock assemblies are adequately designed to prevent failure by corrosion.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.6.4 Melt Area Support Structure

The IQRPE performed an independent engineering corrosion review and assessment for the Melt Area Support Structure. The steel structure will be coated with an unbroken coating film in accordance with the project coating specification in Construction Specification 145579-Q-SP-001 Section 09900. In addition, further protection against corrosion is provided since the support structure is placed on a concrete slab and protected within a weather enclosure.

The IQRPE concurs that this design basis meets the requirements of the DBVS RD&D Permit and WAC 173-303-640.

2.2.6.5 Corrosion Assessment Exceptions

The IQRPE engineering corrosion assessment for the Dried Waste Handling System is included as Attachment E to this report. Although the corrosion review was based on earlier revisions of the specifications, the updated design information did not contain any new information which would change the results of the corrosion review. There are no exceptions to the IQRPE certification of the corrosion assessment.

2.2.7 Recommended Inspection Schedule

Inspection of the Dried Waste Handling System components will be performed at the supplier's facility to ensure they comply with the design, and inspection and testing requirements. The IQRPE will also review the vendor inspection and testing reports, as they are available.

Additionally, before placing the Dried Waste Handling System into service, the system components will be inspected by an IQRPE for structural damage and proper installation. This inspection will include the following:

- Evaluation of the welds to verify no cracking or lack of fusion.
- Confirmation that no punctures, scrapes of protective coating, cracks, corrosion, or other structure damage are present.
- Performance of tank and component tightness test to verify no leaks are present and that pressure or vacuum did not change beyond specifications over the test period.
- Verification of the protection of ancillary equipment against physical damage and stress.

- Installation inspection that conforms to consensus-recognized standards including the documentation of findings and corrective actions documented in a post-inspection report.

The system is only specified to operate for a service life of 2 years and since the equipment has been specified with a design life of 5 years; the IQRPE does not recommend any additional inspections after the system is placed into service. The need for additional annual inspections will be determined by the Owner/Operator in accordance with RD&D Permit Condition IV.A.8.d.i and WAC 173-303-640(6).

The following sections highlight the IQRPE Recommended Inspection Schedule items for each major component after completion of the final design and before placing the Dried Waste Handling System components into service.

2.2.7.1 Dried Waste Transfer System (SP-032, Rev. 1)

The IQRPE recommends the following inspections for the Dried Waste Transfer System:

- Review the final design once completed.
- Review the final vendor design submittals prior to the start of fabrication, as highlighted in Attachment B.
- Review the vendor inspection and testing reports as they become available.
- Complete the IQRPE inspection for structural damage and proper installation and complete the installation assessment report before placing the Dried Waste Handling System into service.

Table 3 lists additional IQRPE recommended inspections for the Dried Waste Transfer System components.

Table 3. Dried Waste Transfer System – Additional IQRPE Inspection Points

Activity	Comments
Primary and Secondary Containment Welding for Dried Waste Transfer System Piping	This step is critical to the successful fabrication of the tank system. The IQRPE or a QII or AWS-certified inspector working under the direction of the IQRPE should review documentation and complete inspections after welding.
Internal Liner Coating Preparation Activities for Dried Waste Transfer System Components	This step is critical to the successful fabrication of the tank system. The IQRPE or a QII or a NACE-certified inspector working under the direction of the IQRPE should complete inspections of the liner coating.

2.2.7.2 Ancillary Waste Transfer Enclosure (AWTE) – (SP-017, Rev. 3)

The IQRPE recommends the following inspections for the Ancillary Waste Transfer Enclosure:

- Review the final design once completed.
- Review the final vendor design submittals as they become available, as highlighted in Attachment B.
- Review the vendor inspection and testing reports as they become available.
- Complete the IQRPE inspection for structural damage and proper installation and complete the installation assessment report before placing the Dried Waste Handling System into service.

2.2.7.3 Dried Waste and Top-Off Soil Airlock Assemblies (SP-018, Rev. 1)

The IQRPE recommends the following inspections for the Dried Waste and Top-Off Soil Airlock Assemblies:

- Review the final design once completed.
- Review the final vendor design submittals as they become available, as highlighted in Attachment B.
- Review the vendor inspection and testing reports as they become available.
- Complete the IQRPE inspection for structural damage and proper installation and complete the installation assessment report before placing the Dried Waste Handling System into service.

2.2.7.4 Recommended Inspection Schedule Exceptions

IQRPE Certification exceptions to the recommended inspection schedule assessment review are as follows:

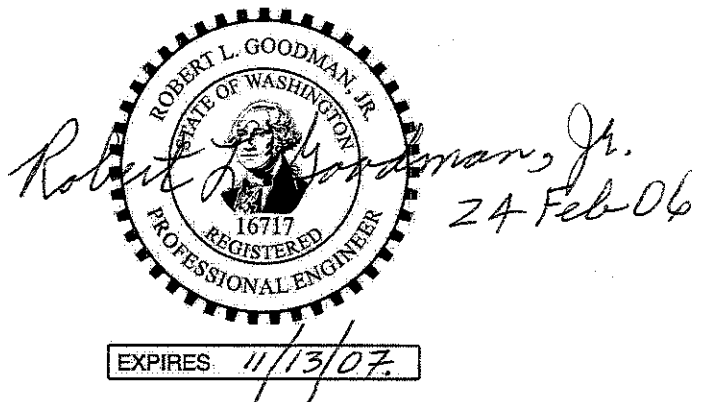
1. The recommended inspection activities described in this section are based on the design basis operating life, operating conditions, and waste characteristics outlined in the Design Basis Report. Should any of these parameters change (for example: extended operating life, increased operating temperatures, lower waste pH), the inspection schedule must be re-evaluated by the IQRPE.

3.0 DESIGN REVIEW ASSESSMENT CERTIFICATIONS

The Dried Waste Handling System IQRPE/RCRA Design Review Package, RPP-24544, Revision D for System 2.4, has been reviewed by the IQRPE and, with the exceptions listed herein, was assessed to be in compliance with the applicable sections of WAC 173-303-640 and the RD&D Permit for the DBVS as stated in Section 1.4 of this report. These results are based on a review of the applicable codes, standards, and documents. The certifications below are in accordance with the requirements of WAC 173-303-640(2)(b) and 173-303-810(13)(a).

Report Lead IQRPE:

I certify under penalty of the law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.



Report Reviewed by:

Robert L. Goodman, Jr. PE for

Karl M. Walterskirchen, PE

Chief Engineer, TGS

24 Feb 06.

Date

4.0 REFERENCES

Washington Administrative Codes (WAC)

WAC 173-303, "Dangerous Waste Regulations"

WAC 173-303-640, "Tank Systems"

WAC 173-303-640(3), "Design and Installation of New Tank Systems or Components"

WAC 173-303-110, "Sampling and Testing Methods"

WAC 173-303-640-810(13)(a), "Certification"

WAC 196-23, "Licensing, Department of Engineers and Land Surveyors, Board of Registration for Professional, Stamping and Seals"

WAC 196-23.020, "Seal/Stamp Usage"

Publication 94-114, "Guidance for Assessing and Certifying Tank Systems that Store and Treat Dangerous Waste", June 1994, Washington State Department of Ecology

Publication 95-420, "Guidance for Assessing Dangerous Waste Secondary Containment Systems", September 1995, Washington State Department of Ecology

ANSI/NEMA MG-1 Revision 1-2004, "NEMA Standards Publication Motors and Generators", September 3, 2004, National Electrical Manufacturers Association

HNF-SD-GN-ER-501, Rev. 1B, "Natural Phenomena Hazards, Hanford Site, South Central Washington."

RPP-17403, Rev. 2, "Function and System Design Requirements for the Demonstration Bulk Vitrification System", 2004, CH2M HILL Hanford Group, Inc.

RPP-24544, Rev. 0, "Demonstration Bulk Vitrification System IQRPE/RCRA Design Review Package", February 21, 2004.

145579-Q-SP-001, Revision C DRAFT. "Construction Specification for the Demonstration Bulk Vitrification System", Division 15 Mechanical, AMEC Earth and Environmental. February 2005.

TFC-ENG-STD-13, Rev. D-1, "Ignition Source Control Evaluation", January 5, CH2M HILL Hanford Group, Inc.

TFC-ENG-DESIGN-P-26, Rev. B-4, "Determination of Equipment Safety Classification and Quality Assurance Level", November 2, 2004, CH2M HILL Hanford Group, Inc.

ATTACHMENT A

DRIED WASTE HANDLING SYSTEM

IQRPE DISPOSITION OF CALCULATIONS, SPECIFICATIONS, AND DRAWINGS

(16 Sheets)

ATTACHMENT A

DRIED WASTE HANDLING SYSTEM

IQRPE DISPOSITION OF CALCULATIONS, SPECIFICATIONS, AND DRAWINGS

Document Number	Document Title	Comments
Calculations		
145579-B-CA-011 Revision 4 (Appendix A4)	Melt Area Support Structure	This calculation was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
145579-B-CA-011 Revision 3 (Appendix A4)	Melt Area Support Structure & Foundation (Fdn #1)	This calculation was reviewed and certified as part of IQRPE Design Certification Report DR-002. A separate review was not conducted for this report.
145579-D-CA-007 Revision C (Appendix A4)	Heat Transfer Analysis - AWTE	This calculation was reviewed for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific contents of this calculation.
Site Maps		
F-145579-00-D-0002 Revision F (Appendix B3)	Bulk Vitrification Site Layout Plan	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
Dried Waste Handling System Drawings		
B-145579-33-F-0401 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-L-401	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0402 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 32-P-402	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.

Document Number	Document Title	Comments
B-145579-33-F-0403 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-Y-403	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0404 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-Y-404	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0406 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-K-0406	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0407 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-Y-407	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0410 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-K-410	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0411 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-Y-411	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.

Document Number	Document Title	Comments
B-145579-33-F-0412 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-P-412	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0413 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-H-413	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0414 Revision D (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-H-414	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0415 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-T-415	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0416 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-V-416	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0417 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Dia Diagram 33-P-417	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.

Document Number	Document Title	Comments
B-145579-33-F-0418 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-P-418	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0419 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-P-419	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0420 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-H-420	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0422 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-H-422	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0423 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-H-423	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-33-F-0424 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 33-P-424	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.

Document Number	Document Title	Comments
B-145579-34-F-0009 Revision E (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-009	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0010 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-010	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0019 Revision E (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-019	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0020 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-020	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0101 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-T-101	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0102 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-T-102	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.

Document Number	Document Title	Comments
B-145579-34-F-0103 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-T-103	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0104 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-T-104	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0112 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-P-112	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0113 Revision D (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-H-113	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0114 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-F-114	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0115 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-P-115	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.

Document Number	Document Title	Comments
B-145579-34-F-0201 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-201	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0202 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-202	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0203 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-203	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0204 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-204	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0205 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-205	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
B-145579-34-F-0206 Revision C (Appendix C4)	Bulk Vitrification Instrument Loop Diagram 34-Y-206	A preliminary review of this drawing was conducted. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report. This drawing will need to be revised using Vendor-supplied instrument data during the detailed design.
DBVS-SK-M107 Revision E, Sheet 1 (Appendix C4)	Bulk Vitrification Dried Waste Transfer System	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.

Document Number	Document Title	Comments
DBVS-SK-M107 Revision C, Sheet 2 (Appendix C4)	Bulk Vitrification Dried Waste Transfer System Plan	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
DBVS-SK-M107 Revision C, Sheet 3 (Appendix C4)	Bulk Vitrification Dried Waste Transfer System Elevations	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-00-B-0001 Revision K (Appendix C4)	Bulk Vitrification Structural Steel General Notes – SH 1	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-00-B-0002 Revision F (Appendix C4)	Bulk Vitrification Structural Steel General Notes – SH 2	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-00-B-0003 Revision J (Appendix C4)	Bulk Vitrification Structural Steel Typical Details – SH 1	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-B-0004 Revision G (Appendix C4)	Bulk Vitrification Structural Steel Typical Details – SH 2	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-B-0005 Revision I (Appendix C4)	Bulk Vitrification Melt Area Structural Stl Plans & Details	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-B-0006 Revision G (Appendix C4)	Bulk Vitrification Melt Area Structural Stl Elevations & Details	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-B-0007 Revision G (Appendix C4)	Bulk Vitrification Melt Area – Grating & Floor Plate Layout	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-B-0010 Revision C (Appendix C4)	Bulk Vitrification Melt Area Structural Stl Stairs & Details	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.

Document Number	Document Title	Comments
F-145579-00-B-0013 Revision A (Appendix C4)	Bulk Vitrification Melt Area Structural Stl Connection Details	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
M101 Revision G (Appendix A4)	AWTE ICV Box Lid Material Feed Port	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
M102 Revision G (Appendix A4)	AWTE ICV Box Lid Inlet & Exhaust Ports	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
M201 Revision G (Appendix A4)	AWTE ICV Box Lid Port Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
M202 Revision G (Appendix A4)	AWTE ICV Box Lid Port Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
M203 Revision G (Appendix A4)	AWTE ICV Box Lid Port Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
M204 Revision G (Appendix A4)	AWTE ICV Box Lid Port Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
M301 Revision G (Appendix A4)	AWTE Room HVAC Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
M302 Revision G (Appendix A4)	AWTE Room Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.

Document Number	Document Title	Comments
F-145579-00-D-0041 Revision F (Appendix C4)	Bulk Vitrification Melt Area G.A. Elevations North and West	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-00-D-0051 Revision F (Appendix C4)	Bulk Vitrification Melt Area G.A. Plan Views	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-00-E-0139 Revision C, Sheet 1 (Appendix C4)	Bulk Vitrification Waste Feed Vacuum Blower Schematic Diagram	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-E-0139 Revision C, Sheet 2 (Appendix C4)	Bulk Vitrification Waste Feed Vacuum Blower Wiring Diagram	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-E-0174 Revision C, Sheet 1 (Appendix C4)	Bulk Vitrification Waste Receiver Airlock Schematic Diagram	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-E-0174 Revision C, Sheet 2 (Appendix C4)	Bulk Vitrification Waste Receiver Airlock Wiring Diagram	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-E-0175 Revision C, Sheet 1 (Appendix C4)	Bulk Vitrification Dry Wst Rec 1 Rot Airlock Schematic Diagram	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-E-0175 Revision C, Sheet 2 (Appendix C4)	Bulk Vitrification Dry Wst Rec 1 Rot Airlock Wiring Diagram	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-E-0176 Revision C, Sheet 1 (Appendix C4)	Bulk Vitrification Dry Wst Rec 2 Rot Airlock Schematic Diagram	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-00-E-0176 Revision C, Sheet 2 (Appendix C4)	Bulk Vitrification Dry Wst Rec 2 Rot Airlock Wiring Diagram	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.

Document Number	Document Title	Comments
F-145579-34-D-0010 Revision B (Appendix C4)	Bulk Vitrification Area 34 ~ Waste Transfer Holes In Floor Plates	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
H-14-106799 Revision 0 (Appendix C4)	Bulk Vitrification Minor Foundations Plans & Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
Dried Waste Handling System P&ID Drawings		
F-145579-33-A-0100 Revision Q (Appendix D4)	Bulk Vitrification Waste Dryer P&ID	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-33-A-0106 Revision G (Appendix D4)	Bulk Vitrification Waste Feed Dryer to Box P&ID	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-34-A-0101 Revision J (Appendix D4)	Bulk Vitrification Waste AWTE Hood & Waste Feed P&ID	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
Dried Waste Handling System Technical Specifications		
145579-D-DS-055.1 Revision 0 (Appendix G4)	Technical Data Sheet – Rotary Valves	This specification was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
145579-D-SP-017 Revision 3 (Appendix G4)	Specification for Ancillary Waste Transfer Enclosure (AWTE)	This specification was reviewed in its entirety, except for Appendices A (Control of Suspect/Counterfeit Items) and C (Instrumentation Naming and Tagging Convention). Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
145579-D-SP-018 Revision 1 (Appendix G4)	Dried Waste & Top-Off Soil Airlock Assemblies	This specification was reviewed in its entirety, except for Appendix A (Control of Suspect/Counterfeit Items). Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.

Document Number	Document Title	Comments
145579-D-DS-018.1 Revision 1 (Appendix G4)	Dried Waste Airlock Assemblies (DWAA) Specification	This specification was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
145579-D-DS-018.2 Revision 1 (Appendix G4)	Top-Off Soil Airlock Assemblies (TSAA) Specification	This specification was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
TECN D-SP-018.R01.1 (Appendix G4)	Technical Engineering Change Notice (TECN) - Dried Waste & Top-Off Soil Airlock Assemblies	This specification was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
145579-D-SP-032 Revision 2 (Appendix G4)	Dried Waste Transfer System	This specification was reviewed in its entirety, except for Appendices D (Control of Suspect/Counterfeit Items), E (Request for Information), and F (Instrumentation Naming and Tagging Convention). Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
Technical Data Sheets Revision 2 Appendix G4: DS-017.2	AWTE Data Sheets	These data sheets were reviewed in their entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
145579-D-SP-017 M101 Revision G Appendix G4: DS-017.2	AWTE ICV Box Lid Material Feed Port	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
145579-D-SP-017 M102 Revision G Appendix G4: DS-017.2	AWTE ICV Box Lid Inlet & Exhaust Ports	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.

Document Number	Document Title	Comments
145579-D-SP-017 M201 Revision G Appendix G4: DS-017.2	AWTE ICV Box Lid Port Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
145579-D-SP-017 M202 Revision G Appendix G4: DS-017.2	AWTE ICV Box Lid Port Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
145579-D-SP-017 M203 Revision G Appendix G4: DS-017.2	AWTE ICV Box Lid Port Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
145579-D-SP-017 M204 Revision G Appendix G4: DS-017.2	AWTE ICV Box Lid Port Details	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
145579-D-SP-017 M301 Revision G Appendix G4: DS-017.2	AWTE Room HVAC Plan	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-34-A-0101 Revision H Appendix G4: DS-017.2	Bulk Vitrification AWTE & Waste Feed P&ID	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.

Document Number	Document Title	Comments
F-145579-34-A-0102 Revision G Appendix G4: DS-017.2	Bulk Vitrification ICV™ Box and AWTE HVAC P&ID	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-35-D-0006 Revision I Appendix G4: DS-017.2	Bulk Vitrification ICV™ Box Lid Steelwork 1 of 3	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
Technical Data Sheets Revision 1 Appendix G4: DS-018.1	Dried Waste Airlock Assembly	These data sheets were reviewed in their entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
Technical Data Sheet Revision 1 Appendix G4: DS-018.2	Top Off Soil Feed Chute Airlock Assembly	These data sheets were reviewed in their entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-34-A-0101 Revision B Appendix G4: DS-018.2	Bulk Vitrification AWTE Hood & Waste Feed P&ID	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-34-A-0102 Revision B Appendix G4: DS-018.2	Bulk Vitrification ICV™ Box and AWTE Hood Instrument Air P&ID	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.

Document Number	Document Title	Comments
F-145579-34-D-0003 Revision E Appendix G4: DS-018.2	Bulk Vitrification Chute Layout ~ Top Off Soil Impingement Tank to ICV™ Box	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-34-D-0006 Revision E Appendix G4: DS-018.2	Bulk Vitrification Chute Layout ~ Waste Silo to ICV™ Box	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
F-145579-00-A-0100 Revision N Appendix G4: SP-032, Appendix A	Bulk Vitrification P&ID Symbol Legend	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
F-145579-33-A-0106 Revision E Appendix G4: SP-032, Appendix A	Bulk Vitrification Waste Feed Dryer to Box P&ID	This drawing was reviewed in its entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
DBVS-SK-E105 Revision A Appendix G4: SP-032, Appendix A	Dried Waste Transfer System Electrical Diagrams	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
DBVS-SK-M107 Revision E, Sheet 1 Appendix G4: SP-032, Appendix A	Bulk Vitrification Dried Waste Transfer System	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.

Document Number	Document Title	Comments
DBVS-SK-M107 Revision C, Sheet 2 Appendix G4: SP-032, Appendix A	Bulk Vitrification Dried Waste Transfer System Plan	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
DBVS-SK-M107 Revision C, Sheet 3 Appendix G4: SP-032, Appendix A	Bulk Vitrification Dried Waste Transfer System Elevations	This drawing was used for information purposes only. The IQRPE certification for the Dried Waste Handling System does not address the specific content of this drawing.
Technical Data Sheets Appendix G4: SP-032, Appendix C	Dried Waste Transfer System	These data sheets were reviewed in their entirety. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
Supporting Information		
"A Corrosion Review" Dated February 5, 2005 Appendix H4	Technical Specifications: <i>Dried Waste Transfer System</i> (145579-D-SP-032, Rev 0) - A Corrosion Review	This corrosion letter was reviewed in its entirety. The IQRPE performed an independent corrosion engineering review for the Dried Waste Handling System. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.
"A Corrosion Review" Dated March 14, 2005 Appendix H4	Technical Specifications: <i>Ancillary Waste Transfer Enclosure (AWTE)</i> (145579-D-SP-017, Rev 2), <i>AWTE Data Sheet</i> (145579-D-DS-017.1, Rev C), <i>Dried Waste & Top-off Soil Airlock Assemblies</i> (145579-D-SP-018, Rev 1), and <i>Top-off Soil Discharge Nozzle Assembly</i> (145579-D-DS-020.2, Rev C) - A Corrosion Review	This corrosion letter was reviewed in its entirety. The IQRPE performed an independent corrosion engineering review for the Dried Waste Handling System including the Ancillary Waste Transfer Enclosure, the Dried Waste & Top-off Soil Airlock Assemblies, and the Top-off Soil Discharge Nozzle Assembly. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.

Document Number	Document Title	Comments
<p>“Response to Corrosion Review for the Dried Waste Transfer System”, DBVS-LDS-014.</p> <p>Dated April 15, 2005</p> <p>Appendix H4</p>	<p>Response to Corrosion Review for the Dried Waste Transfer System</p>	<p>This corrosion letter response was reviewed in its entirety. The IQRPE performed an independent corrosion engineering review for the Dried Waste Handling System. Specific IQRPE review activities and any exceptions are described in Section 2.2 of this report.</p>

ATTACHMENT B

**DRIED WASTE HANDLING SYSTEM DESIGN DELIVERABLES TO BE REVIEWED
WITH THE INSTALLATION CERTIFICATION PACKAGE**

(16 Sheets)

ATTACHMENT B**DRIED WASTE HANDLING SYSTEM DESIGN DELIVERABLES TO BE REVIEWED
AS PART OF THE INSTALLATION CERTIFICATION PACKAGE**

The scope of review for electrical design information and installation and maintenance manuals will be determined by the IQRPE based on a review of the final vendor design information.

Submittal Number	Submittal Title
145579-D-DS-055.1 Revision 0 Rotary Valve - Technical Data Sheets Bidders Drawing and Data Commitments	Technical brochures on purchased components
145579-D-DS-055.1 Revision 0 Rotary Valve - Technical Data Sheets Bidders Drawing and Data Commitment	Electrical schematics, wiring, diagrams and nameplates lists
145579-D-DS-055.1 Revision 0 Rotary Valve - Technical Data Sheets Bidders Drawing and Data Commitment	Calculations
145579-D-DS-055.1 Revision 0 Rotary Valve - Technical Data Sheets Bidders Drawing and Data Commitment	Set of installation and maintenance manuals c/w technical literature for all equipment and devices
145579-D-DS-055.1 Revision 0 Rotary Valve - Technical Data Sheets Bidders Drawing and Data Commitment	NEC inspection certificate & electromagnetic interference test results

Submittal Number	Submittal Title
145579-D-DS-055.1 Revision 0 Rotary Valve - Technical Data Sheets Bidders Drawing and Data Commitment	Site commissioning record & test results
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	100% Design and Fabrication Package Including: Drawings, Calculations, Completed Equipment Data Sheets, Vendor Cut Sheets/Technical Brochures, Bill of Materials
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	Electrical schematics, wiring, diagrams, pneumatic circuit diagrams and nameplate lists
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	FAT Plan/Test Procedures
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	FAT test report

Submittal Number	Submittal Title
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	Set of installation and maintenance manuals c/w technical literature for all equipment and devices
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	NEC inspection certificate & electromagnetic interference test results
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	Site commissioning record & test results
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	NDE personnel certification
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	Visual weld/NDE procedures

Submittal Number	Submittal Title
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	Welding procedures, weld map, procedure qualification records and welder qualification records
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	AWS CWI certificate
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	Material control procedure
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	NCRs
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	CoCs/CMTRs

Submittal Number	Submittal Title
SP-017 Revision 3 Attachment DS-017.2, Revision 2 AWTE Data Sheet Bidder's Drawing & Data Commitments	Manufacturer's standard surface preparation and painting procedure
SP-018 Revision 1 Attachment DS-018.1, Revision 1 Dried Waste Airlock Assembly Bidder's Drawing & Data Commitments	Technical brochures on purchased components
SP-018 Revision 1 Attachment DS-018.1, Revision 1 Dried Waste Airlock Assembly Bidder's Drawing & Data Commitments	Final Drawings + Calculations
SP-018 Revision 1 Attachment DS-018.1, Revision 1 Dried Waste Airlock Assembly Bidder's Drawing & Data Commitments	Set of installation and maintenance manuals c/w technical literature for all equipment and devices
SP-018 Revision 1 Attachment DS-018.1, Revision 1 Dried Waste Airlock Assembly Bidder's Drawing & Data Commitments	Electromagnetic interference test results

Submittal Number	Submittal Title
SP-018 Revision 1 Attachment DS-018.1, Revision 1 Dried Waste Airlock Assembly Bidder's Drawing & Data Commitments	Site commissioning record & test results
SP-018 Revision 1 Attachment DS-018.2, Revision 1 Top Off Soil Feed Chute Airlock Assembly Bidder's Drawing & Data Commitments	Technical brochures on purchased components
SP-018 Revision 1 Attachment DS-018.2, Revision 1 Top Off Soil Feed Chute Airlock Assembly Bidder's Drawing & Data Commitments	Final Drawings + Calculations
SP-018 Revision 1 Attachment DS-018.2, Revision 1 Top Off Soil Feed Chute Airlock Assembly Bidder's Drawing & Data Commitments	Set of installation and maintenance manuals c/w technical literature for all equipment and devices
SP-018 Revision 1 Attachment DS-018.2, Revision 1 Top Off Soil Feed Chute Airlock Assembly Bidder's Drawing & Data Commitments	Electromagnetic interference test results

Submittal Number	Submittal Title
SP-018 Revision 1 Attachment DS-018.2, Revision 1 Top Off Soil Feed Chute Airlock Assembly Bidder's Drawing & Data Commitments	Site commissioning record & test results
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Technical brochures on purchased components
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Final Drawings + Calculations
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Set of installation and maintenance manuals c/w technical literature for all equipment and devices
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Electromagnetic interference test results

Submittal Number	Submittal Title
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Site commissioning record & test results
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	NDE personnel certifications
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Visual weld / NDE procedures
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Welding procedures, weld map, procedure qualification, records, and welder qualification records
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	AWS CWI certificate

Submittal Number	Submittal Title
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Electrical schematics, wiring diagrams, control diagrams, and nameplate lists
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Factory acceptance test (FAT) plan
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Manufacturer's standard surface preparation and painting specification
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	NCR's
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.1 - Dried Waste Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	CoC's / CMTR's

Submittal Number	Submittal Title
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Technical brochures on purchased components
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Final Drawings + Calculations
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Set of installation and maintenance manuals c/w technical literature for all equipment and devices
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Electromagnetic interference test results
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Site commissioning record & test results

Submittal Number	Submittal Title
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	NDE personnel certifications
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Visual weld / NDE procedures
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Welding procedures, weld map, procedure qualification, records, and welder qualification records
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	AWS CWI certificate
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Electrical schematics, wiring diagrams, control diagrams, and nameplate lists

Submittal Number	Submittal Title
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Factory acceptance test (FAT) plan
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	Manufacturer's standard surface preparation and painting specification
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	NCR's
SP-018 Revision 1 Attachment DS-018.R01.1 DS-018.2 - Top Off Soil Airlock Assembly Data Sheet Bidder's Drawing & Data Commitments	CoC's / CMTR's

Submittal Number	Submittal Title
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	90 % Design and Fabrication Package including: - Drawings - Calculations - Completed Equipment Data Sheets - Vendor Cut Sheets/Technical Brochures - Bill of Materials
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Test Plan/Test Procedure
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	NDE personnel certifications
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Visual Weld/NDE procedures
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Visual weld examination procedure / weld map

Submittal Number	Submittal Title
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Welding procedures, procedure qualification records, and welder procedure qualification records
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	AWS CWI certificate
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Material Control Procedures
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Protective coating specifications
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Fabrication travelers

Submittal Number	Submittal Title
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Cleaning Procedures
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	100 % Design and Fabrication Package including: <ul style="list-style-type: none">- Drawings- Calculations- Completed Equipment Data Sheets- Vendor Cut Sheets/Technical Brochures- Bill of Materials
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	NCRs
SP-032 Revision 2 Appendix G DS-032.1, Revision 2 Bidder's Drawing & Data Commitments	Fabrication red-line changes

Submittal Number	Submittal Title
<p>SP-032</p> <p>Revision 2</p> <p>Appendix G</p> <p>DS-032.1, Revision 2</p> <p>Bidder's Drawing & Data Commitments</p>	<p>Final Data Package including:</p> <ul style="list-style-type: none">- As-Built drawings- Fabrication Traveler Closeout- Recommended spare parts and frequency of replacement- Rigging sketches- System assembly instructions- Operation and maintenance manuals- Final Test results (document and video records)- Packing list and identification of shipping supports- Field Calibration Procedures and Reports- Inspection Reports- CoC's / CMTRs- NEC inspection certificate & electromagnetic interference test results

ATTACHMENT C

**CODES, STANDARDS, AND REGULATIONS INCORPORATED INTO TECHNICAL
SPECIFICATION PACKAGES**

(Six Sheets)

ATTACHMENT C

CODES, STANDARDS, AND REGULATIONS INCORPORATED INTO TECHNICAL SPECIFICATION PACKAGES

10 CFR 830	"Nuclear Safety Management," <i>Code of Federal Regulations</i> , as amended.
10CFR835	"Occupational Radiation Protection", <i>Title 10 – Energy, Chapter III – Department of Energy, Part 835 - Occupational Radiation Protection</i> .
29 CFR 1910 (2003)	"Occupational Safety and Health Standards", <i>Code of Federal Regulations</i> , as amended.
40 CFR 264	"Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," subpart J. <i>Code of Federal Regulations</i> , as amended.
47 CRF 15	"Radio Frequency Devices", <i>Code of Federal Regulations</i> , as amended.
AISC Allowable Stress Design	<i>Manual of Steel Construction – Allowable Stress Design</i> , Ninth Edition, American Institute of Steel Construction, Chicago, Illinois.
AISC Load and Resistance Factor Design	<i>Manual of Steel Construction – Load and Resistance Factor Design</i> . Third Edition, American Institute of Steel Construction, Chicago, Illinois.
ANSI / AWS D1.3	<i>Structural Welding Code – Sheet Steel</i> , American Welding Society, Miami, Florida.
ANSI / IEEE C63.16 (1993)	<i>American National Standard Guide for Electrostatic Discharge Test Methodologies and Criteria for Electronic Equipment</i> , American National Standards Institute, Washington, D.C.
ANSI FCI 70-2	<i>Control Valve Seat Leakage</i> , Fluid Controls Institute, Inc., Cleveland, Ohio.
ANSI / HI 3.1-3.5	<i>American National Standard for Rotary Pumps for Nomenclature, Definitions, Applications and Operation</i> , Hydraulic Institute, Parsippany, New Jersey.

ANSI / HI 3.6	<i>American National Standard for Rotary Pump Tests</i> , Hydraulic Institute, Parsippany, New Jersey.
ANSI Y14.1	<i>Drawing Sheet Size and Format</i> , American National Standards Institute, Inc. New York, New York.
ANSI Y14.5M	<i>Dimensioning and Tolerancing</i> , American National Standards Institute, New York, New York.
ASCE 7-98	<i>Minimum Design Loads for Buildings and Other Structures</i> , American Society of Civil Engineers, Reston, Virginia.
ASHRAE Fundamentals Handbook	<i>2001 ASHRAE Handbook – Fundamentals</i> , American Society of Heating, Refrigerating, and Air Conditioning Engineers, Atlanta, Georgia.
ASME AG-1-2003	<i>Code on Nuclear Air and Gas Treatment</i> , American Society of Mechanical Engineers, New York, New York.
ASME B&PV Code Section IX	<i>ASME Boiler and Pressure Vessel Code – Section IX, Welding and Brazing Qualifications</i> , American Society of Mechanical Engineers, New York, New York.
ASME B16.5	<i>Pipe Flanges and Flanged Fittings</i> , American Society of Mechanical Engineers, New York, New York.
ASME B18.2.1 - 1999	<i>Square and Hex Bolts and Screws Inch Series</i> , American Society of Mechanical Engineers, New York, New York.
ASME B30.20	<i>Below-the-Hook Lifting Devices</i> , American Society of Mechanical Engineers, New York, New York.
ASME B31.3 - 2002	<i>Process Piping</i> , American Society of Mechanical Engineers, New York, New York.
ASME NQA-1, 1994	<i>Quality Assurance Program Requirements for Nuclear Facilities</i> , American Society of Mechanical Engineers, New York, New York.
ASME PCC-1, 2000	<i>Guidelines for Pressure Boundary Bolted Flange Joint Assembly</i> , American Society of Mechanical Engineers, New York, New York.

ASME Section VIII, Div 1 or Div 2	<i>Boiler and Pressure Vessel Code, Rules and/or Alternate Rules for Construction of Pressure Vessels, New York, New York.</i>
ASME Y14.5M – 1994	<i>Dimensioning and Tolerancing, American Society of Mechanical Engineers, New York, New York.</i>
ASNT SNT-TC-1A	<i>Recommended Practice, American Society of Nondestructive Testing, Columbus, Ohio.</i>
ASTM A36 / A36M	<i>Standard Specification for Carbon Structural Steel, American Society of Testing and Materials, New York, New York.</i>
ASTM A108	<i>Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality, American Society for Testing and Materials, West Conshohocken, Pennsylvania</i>
ASTM A193-01 / A193M	<i>Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service, American Society for Testing and Materials, West Conshohocken, Pennsylvania</i>
ASTM A194-01 / A194M	<i>Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature Service or Both, American Society for Testing and Materials, West Conshohocken, Pennsylvania</i>
ASTM A269 - 04	<i>Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service, American Society of Testing and Materials, New York, New York.</i>
ASTM A307 - 02	<i>Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A312 – 04a / A312M	<i>Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes, American Society for Testing and Materials, West Conshohocken, Pennsylvania.</i>
ASTM A351-03	<i>Standard Specification for Castings, Austenitic, Austenitic - Ferritic (Duplex), for Pressure</i>

	<i>Containing Parts</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.
ASTM A354 - 01	<i>Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and other Externally Threaded Fasteners</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania
ASTM F436-02	<i>Standard Specification for Hardened Steel Washers</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.
ASTM A480 / A480M	<i>Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.
ASTM A500	<i>Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.
ASTM A563 - 00	<i>Standard Specification for Carbon and Alloy Steel Nuts</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania
ASTM A569	<i>Standard Specification for Steel, Carbon (0.15 Maximum, Percent) Hot-Rolled Sheet and Strip Commercial</i> , American Society for Testing and Materials, West Conshohocken, Pennsylvania.
AWS D1.1 - 02/ D1.1M	<i>Structural Welding Code – Steel</i> , American Welding Society, Miami, Florida.
AWS D1.6 - 99	<i>Structural Welding Code – Stainless Steel</i> , American Welding Society, Miami, Florida.
AWS QC-1	<i>Standard for AWS Certification of Welding Inspectors</i> , American Welding Society, Miami, Florida.
DOE / RL-92-36	<i>Hanford Site Hoisting and Rigging Manual</i> , U.S. Department of Energy, Richland, WA.
HNF-2962, Rev. 0	<i>A List of EMI/EMC Requirements</i> , Rev. O, Numatec Hanford Corporation for Fluor Daniel Hanford, Inc. Richland, Washington.

HNF-SD-GN-ER-501	<i>Natural Phenomena Hazards, Hanford Site, Washington, Revision 1B, Westinghouse Hanford Company, Richland, Washington.</i>
IEEE C62.41.1	<i>IEEE Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits, Institute of Electrical and Electronics Engineers, New York, New York.</i>
IEEE C62.41.2	<i>IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000 V and Less) AC Power Circuits, Institute of Electrical and Electronics Engineers, New York, New York.</i>
IEEE C37.90.2	<i>IEEE Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers, Institute of Electrical and Electronics Engineers, New York, New York.</i>
IEEE 142	<i>IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems, Institute of Electrical and Electronics Engineers, New York, New York.</i>
NEMA MG-1	<i>Motors and Generators, National Electrical Manufacturers Association, Rosslyn, Virginia.</i>
NFPA 70 (2002)	<i>National Electrical Code, 2002 Edition, National Fire Protection Association, Quincy, Massachusetts.</i>
RPP-8530, Rev. 0	<i>Tank Farm Labeling Standard.</i>
SAE J429	<i>Mechanical and Material Requirements for Externally Threaded Fasteners, Society of Automotive Engineers, Warrendale, Pennsylvania.</i>
TFC-ESHQ-QC-C-03, Rev. B	<i>Control of Suspect / Counterfeit Items.</i>
TFC-ENG-STD-06, Rev. A	<i>Hanford Design Standard: Design Loads for Tank Farm Facilities.</i>
TFC-PLN-09, Rev. A-1	<i>Human Factors Program.</i>
UBC, 1997	<i>1997 Uniform Building Code, International Conference of Building Officials, Whittier, California.</i>
UL-Listed	<i>Electrical Appliance and Utilization Equipment Directory, Underwriters Laboratories, Inc., Northbrook, Illinois.</i>

UL 508A	<i>Standard for Industrial Control Panel</i> , Underwriters Laboratories, Inc., Northbrook, Illinois.
UL 840	<i>Standard for Insulation Coordination Including Clearances and Creepage Distances for Electrical Equipment</i> , Underwriters Laboratories, Inc., Northbrook, Illinois.
WAC 173-303-640	<i>Tank Systems</i> , Washington Administrative Code, as amended.
WAC 173-460	<i>Control of New Sources of Toxic Air Pollutants</i> , Washington Administrative Code, as amended.
WAC 246-247	<i>Radiation Protection – Air Emissions</i> , Washington Administrative Code.

ATTACHMENT D

DRIED WASTE HANDLING SYSTEM

PIPING AND INSTRUMENTATION DIAGRAMS

Drawing F-145579-34-A-0101, Rev J

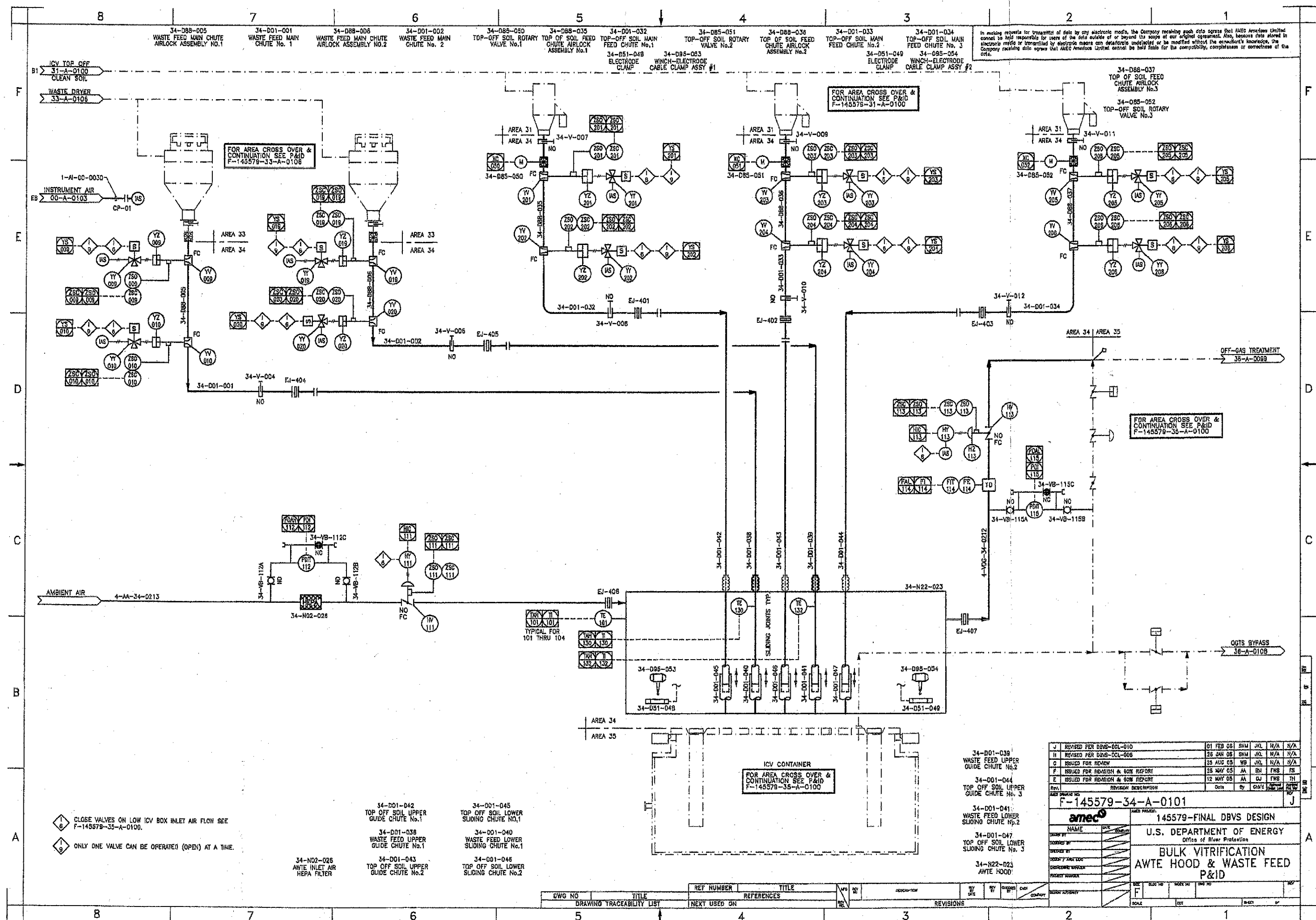
“Bulk Vitrification AWTE Hood & Waste Feed P&ID”

Drawing F-145579-34-A-0102, Rev G

“Bulk Vitrification ICV Box and AWTE HVAC Air P&ID”

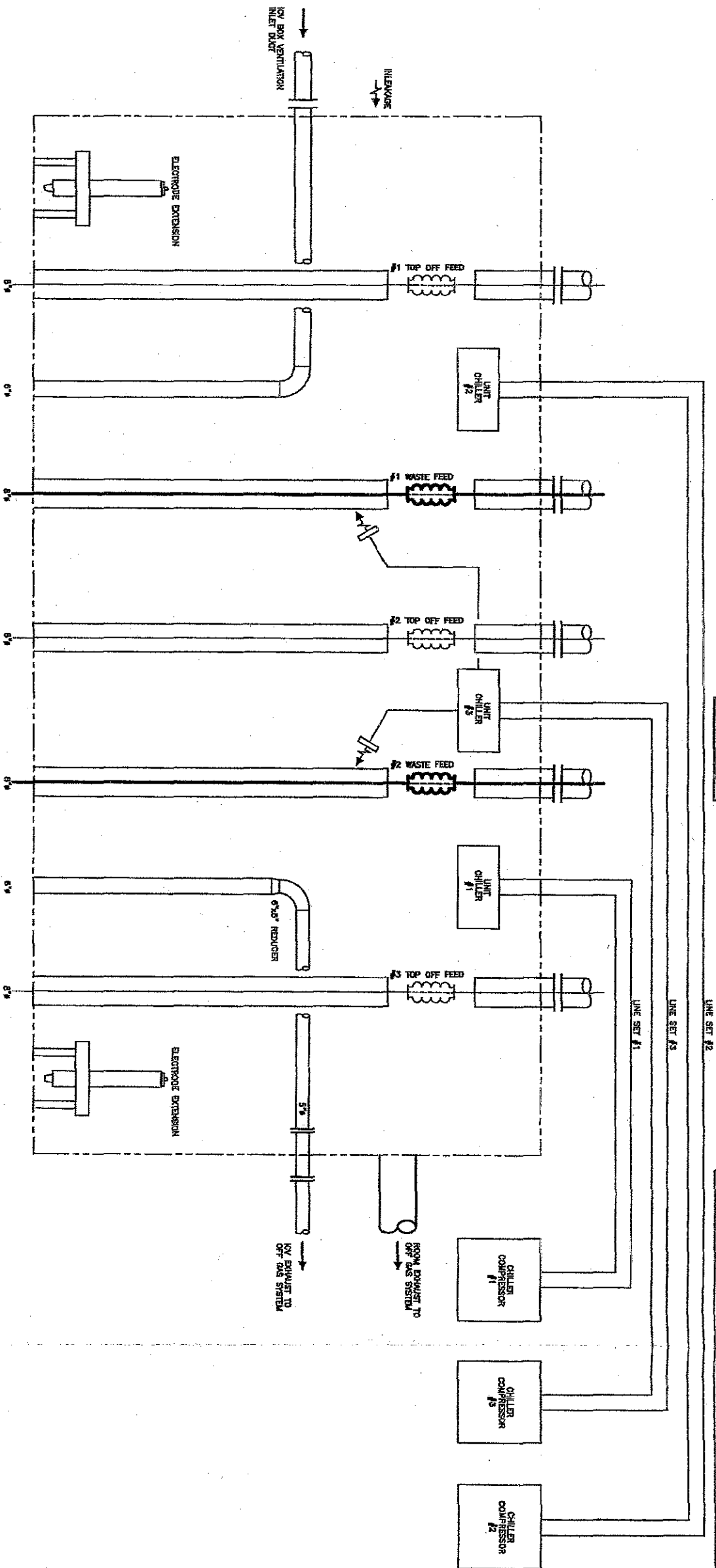
Drawing F-145579-33-A-0106, Rev G

“Bulk Vitrification Waste Feed Dryer to Box P&ID”



FOR AREA CROSS OVER & CONTINUED SEE FIG. 101
F-145579-34-A-0101

It is hereby certified that the design of this work was prepared by the Engineer named herein, who is duly Licensed Professional Engineer in the State of New York, and that he is the author of the design and the design is his original work and not a copy of any other design. He is not aware of any other person who has been or is to be employed by him in the preparation of this design. He is not aware of any other person who has been or is to be employed by him in the preparation of this design. He is not aware of any other person who has been or is to be employed by him in the preparation of this design.

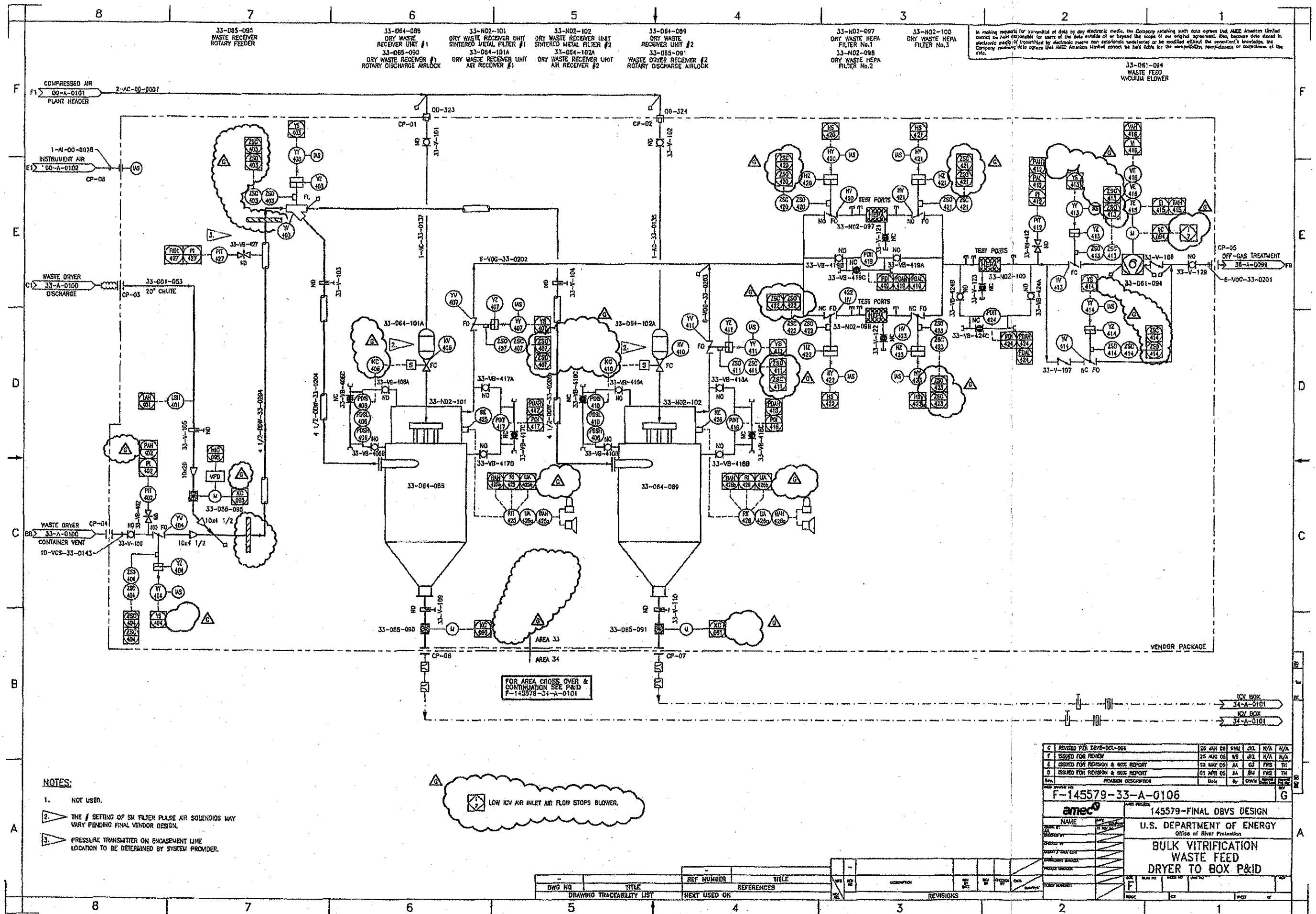


ICV CONTAINER LID
FOR AREA CROSS OVER & CONTINUED SEE FIG. 101
F-145579-34-A-0102

NOTE:
1. INTERLOCK REGISTRATION TO BE UPDATED

REV. NO.	REV. DATE	REV. DESCRIPTION	REV. BY	REV. CHECKED
1	10/1/78	INITIAL DESIGN	J. J. J.	J. J. J.
2	11/1/78	REVISED FOR REVIEW	J. J. J.	J. J. J.
3	12/1/78	REVISED FOR REVIEW	J. J. J.	J. J. J.
4	1/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
5	2/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
6	3/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
7	4/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
8	5/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
9	6/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
10	7/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
11	8/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
12	9/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
13	10/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
14	11/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
15	12/1/79	REVISED FOR REVIEW	J. J. J.	J. J. J.
16	1/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
17	2/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
18	3/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
19	4/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
20	5/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
21	6/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
22	7/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
23	8/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
24	9/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
25	10/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
26	11/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
27	12/1/80	REVISED FOR REVIEW	J. J. J.	J. J. J.
28	1/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
29	2/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
30	3/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
31	4/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
32	5/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
33	6/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
34	7/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
35	8/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
36	9/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
37	10/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
38	11/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
39	12/1/81	REVISED FOR REVIEW	J. J. J.	J. J. J.
40	1/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
41	2/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
42	3/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
43	4/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
44	5/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
45	6/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
46	7/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
47	8/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
48	9/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
49	10/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
50	11/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
51	12/1/82	REVISED FOR REVIEW	J. J. J.	J. J. J.
52	1/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
53	2/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
54	3/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
55	4/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
56	5/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
57	6/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
58	7/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
59	8/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
60	9/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
61	10/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
62	11/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
63	12/1/83	REVISED FOR REVIEW	J. J. J.	J. J. J.
64	1/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
65	2/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
66	3/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
67	4/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
68	5/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
69	6/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
70	7/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
71	8/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
72	9/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
73	10/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
74	11/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
75	12/1/84	REVISED FOR REVIEW	J. J. J.	J. J. J.
76	1/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
77	2/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
78	3/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
79	4/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
80	5/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
81	6/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
82	7/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
83	8/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
84	9/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
85	10/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
86	11/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
87	12/1/85	REVISED FOR REVIEW	J. J. J.	J. J. J.
88	1/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
89	2/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
90	3/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
91	4/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
92	5/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
93	6/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
94	7/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
95	8/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
96	9/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
97	10/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
98	11/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
99	12/1/86	REVISED FOR REVIEW	J. J. J.	J. J. J.
100	1/1/87	REVISED FOR REVIEW	J. J. J.	J. J. J.

U.S. DEPARTMENT OF ENERGY
BULK VITRIFICATION
ICV BOX AND AIR
HVAC AIR P&ID



ATTACHMENT E

ENGINEERING CORROSION REVIEW

(Three Sheets)

April 14, 2005



Northwest Corrosion Engineering

10995 Warfield Road, Sedro-Woolley, WA 98284
Phone: (360) 826-4570 Fax: (360) 826-6321

Mr. Robert Goodman, Jr., P.E.
TechnoGeneral Services Company
710 North 4th Avenue
Pasco, WA 99301

**SUBJECT: Corrosion Engineering Review – DBVS Dried Waste Handling System,
Package 2.4 Revision C**

Mr. Goodman,

Corrosion Engineering related comments concerning DBVS Design Package 2.4 Rev C and the Corrosion Review comments provided by ChemMet, LTD, PC are outlined below.

Technical Specification 145579-D-SP-017 Rev 2 – Ancillary Waste Transfer Enclosure (AWTE) and 145579-D-DS-017.1 AWTE Data Sheet

1. No specific comments are given for Technical Specification D-SP-017 Rev 2.
2. The AWTE Data Sheet requires a surface preparation in accordance with SSPC-SP 6 – Commercial Blast Cleaning. This surface preparation standard will most likely suffice as the operating life of this equipment will be two years. For equipment requiring a longer service life, a more rigorous surface preparation standard such as SSPC-SP 10 or SP 5 should be specified. The coating system to be used is required to be provide by the Seller and, as such, is currently not available for review.

Corrosion Review – Submitted by ChemMet, LTD, dated March 14, 2005 for Technical Specification 145579-D-SP-017 Rev 2 – Ancillary Waste Transfer Enclosure (AWTE) and 145579-D-SP-017.1 AWTE Data Sheet

1. Special consideration should be given to comments 2 and 3 of Dr. Divine's review.

Technical Specification 145579-D-SP-018 Rev 1 – Dried Waste & Top-Off Soil Airlock Assemblies and 145579-D-DS-018.2 Rev 1 – Top-Off Soil Feed Chute Airlock Assembly

1. No specific comments are given for Technical Specification D-SP-018 Rev 1 or D-DS-018.2 Rev 1.

Dried Waste Handling System – DBVS Design Package 2.4
Corrosion Engineering Review

April 14, 2005

Corrosion Review – Submitted by ChemMet, LTD, dated March 14, 2005 for Technical Specification 145579-D-SP-018 Rev 1 – Dried Waste & Top-Off Soil Airlock Assemblies

1. No comments.

Technical Specification 145579-D-SP-020 Rev C – Waste Mixture & Top-Off Soil Discharge Nozzle Assembly Specification and 145579-D-DS-020.2 Rev C – Top-Off Soil Discharge Assembly

1. No specific comments are given for Technical Specification D-SP-020 Rev C or D-DS-020.2 Rev C.

Corrosion Review – Submitted by ChemMet, LTD, dated March 14, 2005 for 145579-D-DS-020.2 Rev C – Top-Off Soil Discharge Assembly

1. No comments.

Technical Specification 145579-D-SP-032 Rev 0 – Dried Waste Transfer System

1. Section 3.3.6 Protective Coatings requires that "Protective coating specifications shall be prepared by the Seller". Reliance has been placed upon the Seller to comply with manufacturer's recommendations for materials, surface preparation, application procedures, environmental controls, etc. As protective coatings are used as the first line of defense against corrosion, it would be prudent to provide the Seller with coating specifications specific to the items to be coated. This will require the Seller to recognize and prepare for a specific set of coating instructions.
2. Provisions should be made to perform 3rd party coating inspection at the application location.
3. Section 4.2 Inspections and Tests paragraph 2 requires that water used for hydrostatic testing shall be tested for chlorides and rejected if chloride concentration is greater than 250 ppm for water temperature less than 149°F. To reduce the possibility of stress corrosion cracking, water used for hydrostatic testing of austenitic stainless steels should contain less than 200 ppm chlorides. After hydrostatic testing is complete, the materials should be immediately flushed with fresh water and dried by circulating air or wiping.

Corrosion Review – Submitted by ChemMet, LTD, dated February 5, 2005 for 145579-D-SP-032 Rev 0 – Dried Waste Transfer System

1. No comments.

Dried Waste Handling System - DBVS Design Package 2.4
Corrosion Engineering Review

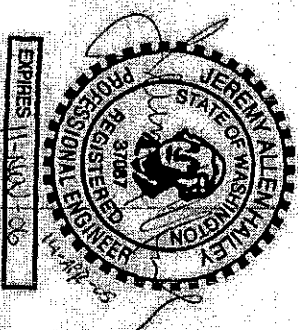
April 14, 2005

We appreciate the opportunity to provide you with this service. Please feel free to contact our office if you have any questions or require additional information.

Sincerely,
Northwest Corrosion Engineering



Jeremy A. Hailey, P.E.
NACE Corrosion Specialist, No. 5401



Northwest Corrosion Engineering (360) 826-4570

Page 3 of 3

Attachment 4
06-ED-023

Permit Tables IV.1, IV.2, IV.3, V.1, V.2, V.3, V.4, V.5, and V.6

Revision 001: November 15, 2006

LIST OF ATTACHMENTS

The following listed documents are hereby incorporated, in their entirety, by reference into this Permit. Some of the documents are excerpts from the Permittees' DBVS Facility Research, Development, and Demonstration Dangerous Waste Permit Application dated May 10, 2004 (document #04-TED-036); hereafter called the Permit Application. Ecology has, as deemed necessary, modified specific language in the attachments. These modifications are described in the permit conditions (Parts I through V), and thereby supersede the language of the attachment. These incorporated attachments are enforceable conditions of this Permit, as modified by the specific permit conditions, except for Attachment 1 which is included in this Permit for information purpose only;

Attachment AA	Facility Description - Section 2 of the Permit Application										
Attachment BB	Waste Analysis Plan - Section 6 of the Permit Application; and Analytical Methods - Appendix D of the Permit Application										
Attachment CC	Personnel Training - Section 8 of the Permit Application										
Attachment DD	Contingency Plan - Section 10 of the Permit Application; and Hanford Test and Demonstration Facility Contingency Plan - Appendix C of the Permit Application										
Attachment EE	Closure Plan - Section 11 of the Permit Application										
Attachment FF	Emergency Preparedness and Prevention - Following Sections of the Permit Application: <table><tr><td>Section 2</td><td>Facility Description</td></tr><tr><td>Section 4</td><td>Bulk Vitrification Test and Demonstration Facility</td></tr><tr><td>Section 5</td><td>Operations Plan</td></tr><tr><td>Appendix B</td><td>Process Flow Diagrams</td></tr><tr><td>Appendix F</td><td>ICV® Container Refractory Information</td></tr></table>	Section 2	Facility Description	Section 4	Bulk Vitrification Test and Demonstration Facility	Section 5	Operations Plan	Appendix B	Process Flow Diagrams	Appendix F	ICV® Container Refractory Information
Section 2	Facility Description										
Section 4	Bulk Vitrification Test and Demonstration Facility										
Section 5	Operations Plan										
Appendix B	Process Flow Diagrams										
Appendix F	ICV® Container Refractory Information										
Attachment GG	Recordkeeping and Reporting - Section 9 of the Permit Application										
Attachment HH	RESERVED										
Attachment II	Inspection Plan - Section 7 of the Permit Application										
Attachment JJ	Container Management - Following Sections and Figures of the Permit Application:										

Revision 001: November 15, 2006

Section 2.3.2	Waste Retrieval and Storage
Section 2.4	Treated Waste Packaging
Section 4.2.9	Vitrification Container Preparation
Section 4.2.10	In-Container Vitrification
Section 4.2.11	Post-Vitrification Activities
Section 7.2.4	Weekly Inspections
Section 7.4	Corrective Action
Figure 2-2	Test and Demonstration Facility Site and Equipment Layout – Page 1
Figure 7-1	Typical Inspection Checklist for Waste Storage Area
Figure B-1	Phase 1 Process Flow Diagram – Page 1
Figure B-4	Phase 2 Process Flow Diagram – Page 1
Appendix F	ICV® Container Refractory Information
Appendix 1	Container Foundations
Appendix 2	Waste Receipt System – Reserved
Appendix 3	Waste Dryer System – Reserved
Appendix 4	Secondary Waste System – Reserved
Appendix 5	Dried Waste Handling System - Reserved

Attachment KK

Tank Management – Following Sections, Figures, and Appendices of the Permit Application:

Section 2.2.1	Bulk Vitrification System Components
Section 2.3.2	Waste Retrieval and Storage
Section 2.3.3	Waste Transfer
Section 2.6	Secondary Wastes
Section 4	Bulk Vitrification Test and Demonstration Facility
Section 7.2.3	Daily Inspections
Section 7.4	Corrective Action
Section 7.5	Recordkeeping
Figure 2-2	Test and Demonstration Facility Site and Equipment Layout – Page 1
Figure 2-4	Waste Retrieval System for Phase 1 and Phase 2
Figure 7-2	Typical Inspection Checklist for Waste Tank Storage Area
Appendix B	Process Flow Diagrams
Appendix F	ICV® Container Refractory Information
Appendix 1	Tank Foundations
Appendix 2	Waste Receipt System
Appendix 3	Waste Dryer System
Appendix 4	Secondary Waste System
Appendix 5	Dried Waste Handling System

Attachment LL

Demonstration Bulk Vitrification System - Following Sections and Appendices of the Permit Application:

Section 4	Bulk Vitrification Test and Demonstration Facility
Section 5	Operations Plan
Appendix A	Draft Test Matrix and Objectives
Appendix B	Process Flow Diagrams
Appendix E	Emergency Condition Parameter Limit Values
Appendix F	ICV® Container Refractory Information
Appendix 1	DBVS Foundations
Appendix 2	Waste Receipt System- Reserved
Appendix 3	Waste Dryer System
Appendix 4	Secondary Waste System — Reserved
Appendix 5	<u>Dried Waste Handling System</u>

Attachment 1	Section 1.0	Introduction
	Section 1.1	Regulatory Basis
	Section 1.2	Facility Owner and Operator Information
	Section 1.3	Background Information
	Section 1.4	Purpose of Test and Demonstration Project
	Section 1.5	Project Objectives
	Section 1.6	Justification for Project
	Section 1.7	Planned Scale of Operation
	Section 1.8	Other Facility Permits

This page intentionally left blank.

TABLE IV.1.

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) FACILITY TANK
 SYSTEMS DESCRIPTION**

Dangerous and/or Mixed Waste Tank Systems Name	System Designation and Equipment Number	Engineering Description (Drawing No., Specification No., etc.)^b	Narrative Description, Table & Figures	Maximum Capacity (gallons)
Waste and Simulant Staging Tank	WRS-Tanks RESERVED	RESERVED	Sections 2.3.2 and 4.2.3; Table 2-1; Figures 2-3, 2-4, and Figure B-7	1,000
Waste and Simulant Staging Tanks	DBVS-Tanks	Permit Attachment KK, Appendix 2, Section 2, Drawing #s: DBVS-SK- M105 and F- 145579-00-P- 0005, Section 5, Specification #: F-145579-D- SP-028.	Sections 2.3.2 and 4.2.2.2; Table 2-1; Figures 2-2 and B-1	
#1	32-D74-002			18,000
#2	32-D74-003			18,000
#3	32-D74-016			18,000
#4	RESERVED			18,000
Receiver Tank From Bottom of Dryer	DBVS-Tanks	RESERVED	RESERVED	RESERVED
Dry Waste-Silos (Hoppers) Receiver Units	DBVS-Tanks	RESERVED	Sections 2.3.3 and 4.2.8 and Figure B-1	<u>NA</u>
#1	34 D002-007 33-D64-088	Permit Attachment KK, Appendix 5, Section 2, Drawings # DBVS-SK- M107, Sheets 2 & 3., Section 5, Specification # 145579-D-SP- 032		140 cubic feet
#2	34 D002-008 33-D64-089			140 cubic feet

Revision 0ed: November 15 March ??, 20056

Dangerous and/or Mixed Waste Tank Systems Name	System Designation and Equipment Number	Engineering Description (Drawing No., Specification No., etc.)^b	Narrative Description, Table & Figures	Maximum Capacity (gallons)
Dryer Condensate Tanks	DBVS-Tanks 37-D74-009 37-D74-010	Permit Attachment KK, Appendix 4, Section 3, Drawing F-145579-37-A-0101; Section 5, Specification 145570-D-SP-031	Sections 2.6 and 4.3.2; Table 4-5; Figures 2-2, B-1, and B-4	Dryer Condensate: 18,000 18,000
Dryer Offgas Condensate Tank	DBVS-Tanks 33-D74-015 33-D74-033	Permit Attachment KK, Appendix 3, Section 3, Drawing F-145579-33-A-0101; Section 5, Specification 145579-D-SP-006	Figure B-1 and B-4	500
Venturi Scrubber System (VSS) #1	DBVS Tank 36-D74-052	RESERVED	Sections 2 and 4; Figures B-2 and B-5	690
#2	36-D74-054			690
Venturi Scrubber System (VSS) Bleed Tanks #1	DBVS -Tanks 37-D74-011	Permit Attachment KK, Appendix 4, Section 3, Drawing F-145579-37-A-0101; Section 5, Specification 145570-D-SP-031	Section 4.2.15; Figures 2-2, B-2, and B-5	18,000
#2	37-D74-012			18,000

Revision 0ed: November 15 March ??, 20065

Tri-Mer Effluent #1	DBVS – Tanks 37-D74-013	Permit Attachment KK, Appendix 4, Section 3,	Sections 2.6 and 4.2.15; Figures 2-2, B-3, and B-6	18,000
#2	37-D74-014	Drawing F- 145579-37-A- 0101;		18,000
#3	RESERVED	Section 5, Specification 145570-D-SP- 031		18,000
#4	RESERVED			18,000
#5	RESERVED			18,000
#6	RESERVED			18,000
NH3 Scrubber Effluent/Bleed Tank	DBVS-Tank RESERVED	RESERVED	Figure B-3	2,000
Tri-Mer Bleed Sump Tank	RESERVED	RESERVED	RESERVED	RESERVED

TABLE IV.2.

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) FACILITY TANK
SYSTEMS SECONDARY CONTAINMENT SYSTEMS
INCLUDING SUMPS AND FLOOR DRAINS**

Sump/Floor Drain I.D. No. & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions (feet) & Materials of Construction	Engineering Description (Drawing No., Specification No., etc.)
WRS Pump Skid, Sample Room	RESERVED	RESERVED	Permit Attachment KK, Appendix 2, Section 2, Drawing # DBVS-SK- M101. Section 5, Specification 145579-D-SP- 027
Pump Skid, Equipment Room	RESERVED	RESERVED	Permit Attachment KK, Appendix 2, Section 2, Drawing # DBVS-SK- M101, Section 5, Specification 145579-D-SP- 027
Waste Receipt Tanks: 32-D74-002 32-D74-003 32-D740016	RESERVED	RESERVED	Permit Attachment KK, Appendix 2, Section 2, Drawing # DVBS-SK- M105, Section 5, Specification: 145579-D-SP- 028

Revision 0ed: November 15 March ??, 20056

Secondary Waste System Pump Skid	RESERVED	RESERVED	Permit Attachment KK, Appendix 4, Section 3, Drawing F- 145579-37-A- 0100, Section 5, Specification 145579-D-SP- 011
Secondary Waste Tanks Dryer Condensate 37-D74-009 37-D74-010	RESERVED	RESERVED	Permit Attachment KK, Appendix 4, Section 3, Drawing F- 145579-37-A- 0101; Section 5, Specification 145570-D-SP- 031
Venturi Scrubber Bleed 37-D74-011 37-D74-012	RESERVED	RESERVED	Permit Attachment KK, Appendix 4, Section 3, Drawing F- 145579-37-A- 0101; Section 5, Specification 145570-D-SP- 031
Tri-Mer 37-D74-013 37-D74-014	RESERVED	RESERVED	Permit Attachment KK, Appendix 4, Section 3, Drawing F- 145579-37-A- 0101; Section 5, Specification 145570-D-SP- 031

Date Issued: December 13, 2004

Permit No.: WA 7890008967

Expiration Date: December 13, 2007

Page 67b of 117

Revision 0ed: November 15 March ??, 20056

Waste Dryer Off-gas Condensate Tank 33-D74-015 33-D74-033	RESERVED	RESERVED	Permit Attachment KK, Appendix 3, Section 3, Drawing F- 145579-33-A- 0101; Section 5, Specification 145579-D-SP- 006.
--	----------	----------	---

TABLE IV.3.

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) FACILITY TANK
 SYSTEMS PROCESS AND LEAK DETECTION SYSTEM INSTRUMENTS AND
 PARAMETERS**

Sub-system Locator and Name (including P&ID)	Control Parameter	Type of Measuring or Leak Detection Instrument	Location of Measuring Instrument (Tag No.)	Instrument Range	Failure State	Expected Range	Instrument Accuracy	Instrument Calibration Method No. and Range
Pump Skid Equipment Room Sump Level Indication F-145579- 32-A-0100	Level	TT-Mini- Probe	32-LSH-011	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
Pump Skid Sample Room Sump Level Indication F-145579- 32-A-0100	Level	TT-Mini- Probe	32-LSH-032	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
Waste Receipt Tanks: 32-D74-002 32-D74-003 32-D74-016 F-145579- 32-A-0101	Level	TT-Mini- Probe	32-LSH-103 32-LSH-203 32-LSH-303	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
Secondary Waste Pump Skid	Level	TT-Mini- Probe	37-LSH-007	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
Secondary Waste Tanks Dryer Condensate 37-D740009 37-D74-010	Level	TT-Mini- Probe	37-LSH-103 37-LSH-203	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
Venturi Scrubber Bleed 37-D74-011 37-D74-012	Level	TT-Mini- Probe	37-LSH-303 37-LSH-403	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
Tri-Mer 37-D74-013 37-D74-014	Level	TT-Mini- Probe	37-LSH-503 37-LSH-603	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

Date Issued: December 13, 2004
Expiration Date: December 13, 2007

Permit No.: WA 7890008967
Page 68 of 117

Revision 0ed: November 15 March ??, 20056

Waste Dryer Off-gas Condensate Tank Level 33-D74-015 33-D74-033	Level	TT-Mini- Probe	33-LIT-017	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
--	-------	-------------------	------------	----------	----------	----------	----------	----------

TABLE V.1.

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) - PHASE 1
 DESCRIPTION FOR NON-MAJOR COMPONENTS (E.G., PUMPS, FILTERS, FANS,
 COMPRESSORS, ETC. NOT SPECIFICALLY LISTED)**

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Control system for feed from the Waste & Simulant Staging Tanks to Waste Dryer ^{a*} (Waste Transfer Pump Skid)	32-D58-007	RESERVED	Sections 2.3.2, 2.3.3, 4.2, 4.2.1, 4.2.2.1, 4.2.3, 4.2.4, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Waste Dryer including:	33-D25-006	Permit Attachment LL; Appendix 3; Section 3, Drawing F-145579-33-A-0100; Section 5, Specification 145579-D-SP-006	Sections 2.3.3, 4.2, 4.2.1, 4.2.8, 4.2.12, 4.2.14, 4.2.15, 4.2.17; Tables 4-1, 4-5; Figures 2-2, B-1, B-2, B-4, and B-5	2645
Dust Recycle Feed to Dryer ^a	00-A-0016			NA
Waste Dryer Sintered Metal Filter	33-NO2-014			
Waste Dryer HEPA Filter	33-NO2-017			
Waste Drying System including: Control system for clean soil feed to dryer ^{a*} The waste dryer steam supply control system ^{a*} Control System for glass former additives feed to dryer ^{a*}	33-D58-068	Permit Attachment LL, Appendix 3, Section 3, Drawings F-145579-31-A-0101, F-145579-33-A-0100 & F-145579-33-A-0105; Section 5, Specifications 145579-D-SP-006 & 145579-D-SP-007	Sections 2.3.3, 4.2, 4.2.1, 4.2.8, 4.2.12, 4.2.14, 4.2.15, 4.2.17; Tables 4-1, 4-5; Figures 2-2, B-1, and B-4	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
DRYER OFFGAS TREATMENT SYSTEM				
Dryer Offgas Condenser including: Condenser chilled water feed control system ^{a*}	33-D10-005	Permit Attachment LL, Appendix 3, Section 3, Drawing F-145579-33-A-0101; Section 5, Specification 145579-D-SP-006	Sections 4.2.14, 4.2.17; Tables 4-2, 4-3, 4-5; Figures 2-2, B-1, and B-4	NA
ICV® STATIONS				
Vitrification Container Preparation*	RESERVED	RESERVED	Sections 4.2.9, 4.2.17; Tables 4-1, 4-5; Figures 2-2 and B-1	N/A
ICV® System (Container Waste Fill, ICV® Melt & Vented Cooling) including: Dry waste feed control system ^a	RESERVED <u>33-D64-088</u> <u>33-D64-089</u>	RESERVED Permit Attachment LL, Appendix 5, Section 3, Drawings F-145579-33-A-0100, F-145579-33-A-0106 & F-145579-A-0101, Section 5, Specifications 145579-D-SP-017, 145579-D-SP-018,	Section 2.2.1, 4.2.11, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Top-off, and Container Sealing including: Top-off soil feed control system ^{a*}	RESERVED <u>31-D74-007</u> <u>31-D74-008</u> <u>31-D74-009</u>	RESERVED Permit Attachment LL, Appendix 5, Section 3, Drawings F-145579-31-A-0100 & F-145579-34-A-0101, Section 5, Specifications 145579-D-DS-055.1 & 145579-D-SP-018	Section 2.2.1, 4.2.11, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Transport to Storage Pad (Sample Point)*	RESERVED	RESERVED	Section 2.2.1, 4.2.11; Figures 2-2, B-1, and B-4	N/A
MAIN OFFGAS TREATMENT SYSTEM				
Sintered Metal Filter #1	36-N02-019	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Table 4-2; Figures B-2 and B-5	N/A
Sintered Metal Filter #2	36-N02-020	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Table 4-2; Figures B-2 and B-5	N/A
Venturi Scrubber System (VSS)-1 Quencher #1	36-N83-034	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-3; Figures B-2 and B-5	RESERVED
VSS-1 Scrubber Feed System Tank #1 ^{a*} includes: Caustic make-up feed control system ^{a*}	36-D74-052	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17; Table 4-5; Figures B-2 and B-5	N/A
VSS-1 Heat Exchanger #1 includes: Chilled water feed control system ^{a*}	36-D30-046	RESERVED	Figures B-2 and B-5	RESERVED

Revision 0ab: November 15 March ??, 20056

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
VSS -1 Scrubber #1	36-N73-035	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-4, 4-5; Figures B-2 and B-5	RESERVED
VSS-1 Mist Eliminator #1	36-N24-036	RESERVED	Sections 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-3; Figures B-2 and B-5	N/A
Venturi Scrubber System (VSS)-2 Quencher #2	36-N83-037	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-3; Figures B-2 and B-5	RESERVED
VSS-2 Scrubber Tank Feed System #2 ^{a*} includes: Caustic make-up feed control system ^{a*}	36-D74-054	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17; Table 4-5; Figures B-2 and B-5	N/A
VSS-2 Heat Exchanger #2 includes: Chilled water feed control system ^{a*}	36-D30-047	RESERVED	Figures B-2 and B-5	RESERVED

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
VSS-2 Scrubber #2	36-N73-038	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-4, 4-5; Figures B-2 and B-5	RESERVED
VSS-2 Mist Eliminator #2	36-N24-039	RESERVED	Sections 4.2.15, 4.2.17; Figures B-2 and B-5	N/A
Scrubber Condenser	36-D10-040	RESERVED	Figures B-2 and B-5	N/A
Mist Eliminator #3	36-N24-041	RESERVED	Figures B-2 and B-5	N/A
HEPA Filter Heater*	36-N84-042	RESERVED	Sections 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-2, 4-3, 4-5, 4-6; Figures 2-2 and B-2	N/A
HEPA Filters #1 #2 #3	36-N02-043 36-NO2-044 36-NO2-045	RESERVED RESERVED RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Tables 4-2, 4-6; Figures B-2 and B-5	N/A
Carbon Filter	36-NO2-064	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17, 4.3.3; Tables 4-2, 4-6; Figures 2-2, B-2, and B-5	N/A
Offgas Polishing Filter	36-NO2-79	RESERVED	Figures 2-2 and B-3	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Tri-Mer Quencher includes: Water feed control system ^{a*}	36-N83-068	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer OX1 Tower including: H ₂ SO ₄ feed control system ^{a*} NaClO ₂ feed control system ^{a*}	36-D77-069	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer RC1 Tower & RC1 Tower Sump including: Na ₂ S feed control system ^{a*} NaOH feed control system ^{a*}	36-D77-070 36-D74-074	RESERVED RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer OX2 Tower including: H ₂ SO ₄ feed control system ^{a*} NaClO ₂ feed control system ^{a*}	36-D77-071	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED

Revision 0ab: November 15 March ??, 20056

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Tri-Mer RC2 Tower & RC2 Tower Sump including: Na ₂ S feed control system ^{a*} NaOH feed control system ^{a*}	36-D77-072 36-D74-075	RESERVED RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
Tri-Mer CC Tower & CC Tower Sump including: NaOH feed control system ^{a*}	36-D77-073 36-D74-076	RESERVED RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVED
SCR Heater*	36-N84-078	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A
SCR Catalyst Bed including: Ammonia feed control system ^{a*}	36-D59-003	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
SCR Heat Exchanger*	36-D30-077	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A
Ammonia scrubber including: Dilute H ₂ SO ₄ feed control system ^{a*}	RESERVED	RESERVED	Figures B-3 and B-6	N/A
Offgas Exhaust Stack*	36-N26-024	RESERVED	Section 4.2.12, 4.2.17; Figures 2-2, B-3, and B-6	N/A

^a These subsystems only include feed control system components, with the exception of the boiler, which only includes the steam control system for the dryer. No substitution of terms as referenced in Permit Conditions II.G.2.e. and V. are to be made in this Permit for these subsystems.

* No substitution of terms as referenced in Permit Conditions II.G.2.e. and V. are to be made in this Permit for these subsystems.

N/A means no secondary containment required

TABLE V.2.

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) -PHASE 1
SECONDARY CONTAINMENT SYSTEMS INCLUDING SUMPS AND FLOOR
DRAINS**

Sump/Floor Drain I.D. No. & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions (feet) & Materials of Construction	Engineering Description (Drawing No., Specification No., etc.)
Waste Dryer Skid 33-D58-068	RESERVED	RESERVED	Permit Attachment LL, Appendix 3, Section 3, Drawing F-145579-33-A- 0100, Section 5, Specification 145579-D-SP-006
RESERVED	RESERVED	RESERVED	RESERVED

TABLE V.4.

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) - PHASE 2
 DESCRIPTION FOR NON-MAJOR COMPONENTS (E.G., PUMPS, FILTERS, FANS,
 COMPRESSORS, ETC NOT SPECIFICALLY LISTED)**

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Control system for feed from the Waste & Simulant Staging Tanks to Waste Dryer ^{a*} (Waste Transfer Pump Skid)	32-D58-007	RESERVED	Sections 2.3.2, 2.3.3, 4.2, 4.2.1, 4.2.2.1, 4.2.3, 4.2.4, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Waste Dryer including:	33-D25-006	Permit Attachment LL; Appendix 3; Section 3, Drawing F-145579-33-A-0100; Section 5, Specification 145579-D-SP-006	Sections 2.3.3, 4.2, 4.2.1, 4.2.8, 4.2.12, 4.2.14, 4.2.15, 4.2.17; Tables 4-1, 4-5; Figures 2-2, B-1, B-2, B-4, and B-5	2645
Dust Recycle Feed to Dryer ^a	00-A-0016			NA
Waste Dryer Sintered Metal Filter	33-NO2-014			
Waste Dryer HEPA Filter	33-NO2-017			
Waste Drying System including: Control system for clean soil feed to dryer ^{a*} The waste dryer steam supply control system ^{a*} Control System for glass former additives feed to dryer ^{a*}	33-D58-068	Permit Attachment LL, Appendix 3, Section 3, Drawings F-145579-31-A-0101, F-145579-33-A-0100 & F-145579-33-A-0105; Section 5, Specifications 145579-D-SP-006 & 145579-D-SP-007	Sections 2.3.3, 4.2, 4.2.1, 4.2.8, 4.2.12, 4.2.14, 4.2.15, 4.2.17; Tables 4-1, 4-5; Figures 2-2, B-1, and B-4	N/A

Revision 0ab: November 15 March ??, 20056

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
DRYER OFFGAS TREATMENT SYSTEM				
Dryer Offgas Condenser including: Condenser chilled water feed control system ^{a*}	33-D10-005	Permit Attachment LL, Appendix 3, Section 3, Drawing F-145579-33-A-0101; Section 5, Specification 145579-D-SP-006	Sections 4.2.14, 4.2.17; Tables 4-2, 4-3, 4-5; Figures 2-2, B-1, and B-4	NA
ICV® STATIONS				
Vitrification Container Preparation*	RESERVED	RESERVED	Sections 4.2.9, 4.2.17; Tables 4-1, 4-5; Figures 2-2 and B-1	N/A
ICV® System (Container Waste Fill, ICV® Melt & Vented Cooling) including: Dry waste feed control system ^a	<u>33-D64-088</u> <u>33-D64-089</u> RESERVED	<u>Permit Attachment LL, Appendix 5, Section 3, Drawings F-145579-33-A-0100, F-145579-33-A-0106 & F-145579-A-0101, Section 5, Specifications 145579-D-SP-017, 145579-D-SP-018, RESERVED</u>	Section 2.2.1, 4.2.11, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Top-Off, and Container Sealing including: Top-off soil feed control system ^{a*}	<u>31-D74-007, 31-D74-008, 31-D74-009</u> RESERVED	<u>Permit Attachment LL, Appendix 5, Section 3, Drawings F-145579-31-A-0100 & F-145579-34-A-0101, Section 5, Specifications 145579-D-DS-055.1 & 145579-D-SP-018</u> RESERVED	Section 2.2.1, 4.2.11, 4.2.12, 4.2.17; Table 4-1; Figures 2-2, B-1, and B-4	N/A
Transport to Storage Pad (Sample Point)*	RESERVED	RESERVED	Section 2.2.1, 4.2.11; Figures 2-2, B-1, and B-4	N/A

Revision 0ab: November 15 March ??, 20056

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
MAIN OFFGAS TREATMENT SYSTEM				
Sintered Metal Filter #1	36-N02-019	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Table 4-2; Figures B-2 and B-5	N/A
Sintered Metal Filter #2	36-N02-020	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Table 4-2; Figures B-2 and B-5	N/A
Venturi Scrubber System (VSS)-1 Quencher #1	36-N83-034	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-3; Figures B-2 and B-5	RESERVE D
VSS-1 Scrubber Feed System Tank #1 ^{a*} includes: Caustic make-up feed control system ^{a*}	36-D74-052	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17; Table 4-5; Figures B-2 and B-5	N/A
VSS-1 Heat Exchanger #1 includes: Chilled water feed control system ^{a*}	36-D30-046	RESERVED	Figures B-2 and B-5	RESERVE D
VSS -1 Scrubber #1	36-N73-035	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-4, 4-5; Figures B-2 and B-5	RESERVE D

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
VSS-1 Mist Eliminator #1	36-N24-036	RESERVED	Sections 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-3; Figures B-2 and B-5	N/A
Venturi Scrubber System (VSS)-2 Quencher #2	36-N83-037	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17; Tables 4-1, 4-2, 4-3; Figures B-2 and B-5	RESERVE D
VSS-2 Scrubber Tank Feed System #2 ^{a*} includes: Caustic make-up feed control system ^{a*}	36-D74-054	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17; Table 4-5; Figures B-2 and B-5	N/A
VSS-2 Heat Exchanger #2 includes: Chilled water feed control system ^{a*}	36-D30-047	RESERVED	Figures B-2 and B-5	RESERVE D
VSS-2 Scrubber #2	36-N73-038	RESERVED	Sections 4.2.4, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-4, 4-5; Figures B-2 and B-5	RESERVE D
VSS-2 Mist Eliminator #2	36-N24-039	RESERVED	Sections 4.2.15, 4.2.17; Figures B-2 and B-5	N/A
Scrubber Condenser	36-D10-040	RESERVED	Figures B-2 and B-5	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Mist Eliminator #3	36-N24-041	RESERVED	Figures B-2 and B-5	N/A
HEPA Filter Heater*	36-N84-042	RESERVED	Sections 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-2, 4-3, 4-5, 4-6; Figures 2-2 and B-2	N/A
HEPA Filters #1	36-N02-043	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17; Tables 4-2, 4-6; Figures B-2 and B-5	N/A
#2	36-NO2-044	RESERVED		
#3	36-NO2-045	RESERVED		
Carbon Filter	36-NO2-064	RESERVED	Sections 4.2.12, 4.2.15, 4.2.17, 4.3.3; Tables 4-2, 4-6; Figures 2-2, B-2, and B-5	N/A
Offgas Polishing Filter	36-NO2-79	RESERVED	Figures 2-2 and B-3	N/A
Tri-Mer Quencher includes: Water feed control system ^{a*}	36-N83-068	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVE D
Tri-Mer OX1 Tower including: H ₂ SO ₄ feed control system ^{a*} NaClO ₂ feed control system ^{a*}	36-D77-069	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVE D

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
Tri-Mer RC1 Tower & RC1 Tower Sump including: Na ₂ S feed control system ^{a*} NaOH feed control system ^{a*}	36-D77-070 36-D74-074	RESERVED RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVE D
Tri-Mer OX2 Tower including: H ₂ SO ₄ feed control system ^{a*} NaClO ₂ feed control system ^{a*}	36-D77-071	RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVE D
Tri-Mer RC2 Tower & RC2 Tower Sump including: Na ₂ S feed control system ^{a*} NaOH feed control system ^{a*}	36-D77-072 36-D74-075	RESERVED RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVE D
Tri-Mer CC Tower & CC Tower Sump including: NaOH feed control system ^{a*}	36-D77-073 36-D74-076	RESERVED RESERVED	Sections 4.2.4, 4.2.6, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5; Figures 2-2, B-3, and B-6	RESERVE D
SCR Heater*	36-N84-078	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, B-6	N/A

Sub-system Description	Sub-system Designation	Engineering Description (Drawing No., Specification No., etc.)	Narrative Description, Tables and Figures	Maximum Capacity (gallons)
SCR Catalyst Bed including: Ammonia feed control system ^{a*}	36-D59-003	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A
SCR Heat Exchanger*	36-D30-077	RESERVED	Sections 4.2.4, 4.2.6, 4.2.7, 4.2.12, 4.2.15, 4.2.17, 4.3; Tables 4-1, 4-2, 4-5, 4-6; Figures 2-2, B-3, and B-6	N/A
Ammonia scrubber including: Dilute H ₂ SO ₄ feed control system ^{a*}	RESERVED	RESERVED	Figures B-3 and B-6	N/A
Offgas Exhaust Stack*	36-N26-024	RESERVED	Section 4.2.12, 4.2.17; Figures 2-2, B-3, and B-6	N/A

^a These subsystems only include feed control system components, with the exception of the boiler, which only includes the steam control system for the dryer. No substitution of terms as referenced in Permit Conditions II.G.2.e. and V. are to be made in this Permit for these subsystems.

* No substitution of terms as referenced in Permit Conditions II.G.2.e. and V. are to be made in this Permit for these subsystems.

N/A means no secondary containment required

TABLE V.5.

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) – PHASE 2
SECONDARY CONTAINMENT SYSTEMS INCLUDING SUMPS AND FLOOR
DRAINS**

Sump/Floor Drain I.D. No. & Room Location	Maximum Sump Capacity (gallons)	Sump Dimensions (feet) & Materials of Construction	Engineering Description (Drawing No., Specification No., etc.)
Waste Dryer Skid 33-D58-068	RESERVED	RESERVED	Permit Attachment LL, Appendix 3, Section 3, Drawing F- 145579-33-A- 0100, Section 5, Specification 145579-D-SP- 006
RESERVED	RESERVED	RESERVED	RESERVED

TABLE V.6.

DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) – PHASE 2 PROCESS AND LEAK DETECTION SYSTEM INSTRUMENTS AND PARAMETERS

[illegible]

TABLE V.7.

**MAXIMUM FEED AND FEED-RATES TO DEMONSTRATION BULK
 VITRIFICATION SYSTEM (DBVS) – PHASE 1 AND 2**

Description of Waste	Phase 1	Phase 2
Tank 241-S-109 Waste	1080 gallons	300,000 gallons
# of ICV® Container Loads	3	50 minus number of ICV® Container Loads processed during Phase 1
Dryer Feed (pounds/hour)	RESERVED	RESERVED
Mixed Waste	RESERVED	RESERVED
Simulant Dangerous Waste	RESERVED	RESERVED
Simulant Non-Dangerous Waste	RESERVED	RESERVED
Soil	RESERVED	RESERVED
ICV® Feed (pounds/hour)	RESERVED	RESERVED
Mixed Waste	RESERVED	RESERVED
Simulant Dangerous Waste	RESERVED	RESERVED
Simulant Non-Dangerous Waste	RESERVED	RESERVED
Soil	RESERVED	RESERVED
Dryer Feed (pounds/hour)	RESERVED	RESERVED
Total Chlorine/Chloride Feed-rate	RESERVED	RESERVED
Total Metal Feed-rates	RESERVED	RESERVED
Arsenic	RESERVED	RESERVED
Cadmium	RESERVED	RESERVED
Chromium (total)	RESERVED	RESERVED
Lead	RESERVED	RESERVED
Mercury	RESERVED	RESERVED
Beryllium	RESERVED	RESERVED
Total Organics (Organic Compounds listed on Table 6-1 of Attachment BB of this Permit.	RESERVED	RESERVED

TABLE V.8.

**DEMONSTRATION BULK VITRIFICATION SYSTEM (DBVS) EMERGENCY
PARAMETER CONTROL / RESPONSE SYSTEM (RESERVED)**

Sub-system Designation	Instrument or Component Tag Number	Parameter Description	Setpoints Limits During Phase 1	Setpoints Limits During Phase 2 Campaign No.	Respond to Deviation from setpoint*
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED
RESERVED	RESERVED	RESERVED	RESERVED	RESERVED	RESERVED

*(e.g., automatically cut-off and/or lock-out the dangerous and mixed waste feed to the DBVS, etc.)

Date Issued: December 13, 2004
Expiration Date: December 13, 2007

Permit No.: WA 7890008967

Page 110a of 117

Revision 0ab: November 15 March ??, 20056

This page intentionally left blank.